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ANNUAL REPORT

—OF THE—

Water Department

—TO THE—

Mayor and City Council of Baltimore

—FOR THE—

Fiscal Year Ended December 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

THE WATER BOARD OF BALTIMORE CITY.

DECEMBER 31, 1902.

ALFRED M. QUICK,
President of Board and Water Engineer.

JAMES T. MILLER,

ALBERT C. TOLSON,

DR. M. H. CARTER,

W. W. VARNEY.

REPORT.

BALTIMORE, January 1, 1903.

To the Honorable the Mayor and
City Council of Baltimore:

In accordance with the requirements of city regulations we herewith submit our report for the year ending December 31, 1902.

Appropriation and Expenditures.

Our appropriation for the year was $85,820.00 for salaries and $363,220.00 for expenses. Our expenditures for the year from these appropriations were $79,502.90 for salaries and $337,269.50 for expenses, leaving unexpended balances of $6,317.10 and $25,950.50 respectively. The balance of $25,950.50 from our expense appropriation was increased by $137.67 from miscellaneous receipts at the Comptroller's office credited by him to that account, making a total balance of $26,088.17 from the appropriation for expenses. The whole of this amount, at our request, has been carried over to 1903, $21,596.02 to be applied on the contract for erecting the new store house for this department, and $4,492.15 to be applied on contracts for Venturi meters and machine shop tools, all of which contracts were let in 1902. Besides these expenditures charged directly to our appropriation, $9,607.18 additional was expended by us for new meters, which was taken from the receipts for the installation of new meter supplies during the year, as has been done for the last four or five years.

Expenditures from Old Loan.

In addition to the above regular appropriations, there remained on January 1, 1902, a balance of $169,907.67 unexpended from the $4,000,000.00 loan of 1945, $2,000,000.00 of which was for improvements in the Water Service. All of this balance was available, by action of the Board of Estimates, for the work of dredging Loch Raven. Of this amount we expended during the year $84,682.58 in payments for construction of the new dredging machinery, contract for which was made in 1901; $1,748.00 for a coal bin wharf at Loch Raven; and $14,162.38 for operating expenses in dredging, a total of $100,592.96; leaving an unexpended balance from this loan of $69,314.71 on January 1, 1903.

Receipts and Surplus.

The total receipts from all sources credited to the Water Service, water rents, plumbing bills, service work, sales of materials, etc., were $866,412.67, including as receipts $13.00 for wages charged on the pay-roll and afterwards returned, leaving actual receipts of $866,399.67. The total expenses of our department were $426,379.78, and of the Collector of Water Rents Department, including $380,000.00 for interest on loans, $403,814.81, making a total of $830,194.59. Our gross surplus for the year was therefore $866,399.67 minus $830,194.59, or $36,205.08. Deducting from this amount the $26,088.17 carried over to 1903 on unfinished 1902 contracts, leaves $10,116.91, the net surplus, which we have turned over to the Finance Commissioners as required by the city ordinances. As last year was the first year of operation under the ordinance reducing the water rents by over $170,000.00, we feel that the department is to be congratulated on finishing the year with a net surplus of over $10,000.00.

Increase in Receipts and Expenses since 1899.

This result is due to two causes. First, the economical and business-like methods in force in this Department have kept

down our expenses, and second, the most careful and thorough inspection of metered and other properties and close collections by this Department and the Collector of Water Rents have largely increased our revenues. In the three years under our administration the total increase in the expenses of the Water Service has been only about ten per cent., or a little over $75,000.00, while the increase in revenues from water rents in the same period has been over twenty per cent., or more than enough to offset the $170,000.00 reduction made by the new water rate ordinance which went into effect January 1, 1902. During the same period our receipts from miscellaneous sources collected in the Water Engineer's office, for rents, sales of materials, etc., have increased over forty-five per cent. If this proportionally much greater rate of increase of revenues over expenditures continues in the future, as it ought to continue with an efficient and economical administration, we will be able to pay out of our receipts all interest and sinking fund charges on account of the new $1,000,000 water loan, and also can make in a few years still further reductions in the water rates. We believe that the next reduction made in water rates should be in the shape of a lower meter rate for large amounts of water consumed.

New One Million Dollar Loan.

Several noteworthy events affecting this Department have marked the year 1902. The most important of these has been the securing of a loan of $1,000,000 for two specific purposes, the increase of our clear water storage capacity, and the extension of the City water service to cover all districts within the city limits not having the benefit of city water. These improvements were recommended by us in our report for the year 1901. The enabling act authorizing the loan was passed by the Legislature in March. The ordinance authorizing the issue of stock and submitting the question to the voters was passed in October. On November 4th, election day, the loan was approved by the voters

by a very large majority. Immediately thereafter we made up our estimate of the amounts which we would require from the loan for the specific purposes mentioned for the year 1903. We asked for $350,000 for the necessary land and such construction work as could be done on the proposed additional clear water storage reservoir in 1903; $70,000 for extending the city water service to the extreme northern section of the city east of Jones' Falls, and $225,000 for the acquisition of the Baltimore County Water and Electric Co.'s rights in and the extensions of city mains to the section of the city west of Gwynn's Falls. These amounts were granted by the Board of Estimates, and were included in the Ordinance of Estimates for 1903. Arrangements are now well under way for all of this work.

New Reservoir.

The new reservoir is to be for the High Service District, as recommended by former Consulting Engineer Gray six years ago, and as experience since then has demonstrated to be most advisable and necessary. It will probably be located somewhere in the northwestern section of the city, so as to be near the force main from the Mt. Royal Pumping Station, from which it must be supplied. Plans for the construction of this reservoir will be made as soon as possible after the site has been selected by the Commission named in the Ordinance of Estimates.

Extension of Upper Service.

The extension of the Upper Service to the extreme northern section of the city east of Jones' Falls will be made by running a force main from the Western Pumping Station in Druid Hill Park across the falls to a standpipe to be erected on the high ground near Roland avenue, and by cutting off from the High Service, mains now laid in streets that are to be supplied by the Upper Service, and connecting them to the new force main. One of the present pumps at the

Western Pumping Station will then be used for supplying this section while the other will continue to supply as before the Western Upper Service District. Plans for this work have been made, and construction will be begun as soon as we have selected a site for the standpipe.

Extension west of Gwynn's Falls.

Preliminary negotiations are now being made with the Baltimore County Water and Electric Co. for the transfer to us of their mains and rights in the district west of Gwynn's Falls, with good prospect of an early settlement. As soon as possible after we have acquired its holdings in that section, we will put the city water into the present mains there, and afterwards lay such new mains as may be necessary to give an efficient service and proper fire protection.

Reduction in Water Rents.

Another noteworthy occurrence marking the year 1902 was the reduction of water rents on all private houses less than eighteen feet in width. The ordinance fixing the lower rates was passed by the City Council in 1901, and took effect on January 1, 1902. We estimate, from the properties on the Collector of Water Rents' books in 1902, that the owners of private houses saved in 1902, and will save annually by this reduction, over $172,000.00. To the present Water Board belongs the credit not only for the suggestion that some reduction in water rents should be made, but also for administering the Department so economically as to make the reduction possible. In our first annual report, that for the year 1900, we called attention to the fact that the surplus of this Department had for several years been larger than any requirements of the Water Loan Sinking Funds would demand, and we at that time advised that a reduction in water rents should be made so as to reduce the amount of the surplus.

New Dredging Plant at Loch Raven.

Another important event during the year was the completion of the fine modern plant for dredging Loch Raven. The plant was built by the Atlantic, Gulf and Pacific Company on our specifications as to capacity and general characteristics, but on the specifications and plans of the contractors as to details. Our specifications required that the plant should have a capacity, when operating under normal conditions, of 3,500 cubic yards in ten hours. The dredge was ready for its trial run on May 21, and was then given a ten-day test by the contractors. Forty-nine thousand cubic yards were excavated in the one hundred hours' run, or 40 per cent. in excess of the requirements of the specifications. The dredge was, therefore, formally accepted by us on June 13 and put in commission on June 17. It was operated continuously from that time until December 6, and during that period excavated 411,460 cubic yards of material from the lake, and about 12,000 cubic yards from the bank to form its own dock. This is over three times the amount ever removed in the same period by the old dredge. The contract price for the plant, including the dredge itself, a large coal scow, twenty pontoons, a gasoline launch and about 10,000 feet of discharge pipe, was $98,000.00.

Cost of Dredging.

The cost of operation, including all repairs and supplies, was $14,162.38, or about three and one-half cents a yard for dredging the 423,460 yards removed. This is less than one-fourth of the lowest contract price bid for doing this work when the contract for building the dredge was let. Consequently the work which we have already done has cost us over $40,000.00 less than it would have cost by contract. With over 2,000,000 cubic yards to be dredged from the lake, we will save on the whole work more than twice the cost of the dredging plant. At that rate the balance of $69,314.71 left from the old loan available for this work will be more than enough to cover the cost of operation.

New Coal Bin and Wharf.

In order to insure that the work of dredging could be carried on continuously we found it would be necessary to have some coal storage at Loch Raven. Consequently we had erected on the shore of the lake a hundred-ton coal bin and wharf from which coal can be taken by scow to the dredge as required, and providing a storage sufficient for about two weeks' run. This structure was erected by contract for $1,748.00.

Improvements at Lake Roland.

Considerable improvement has been made at Lake Roland. The Towson Branch has been cleared of sediment from the Northern Central Railway to the Sand Trap, and the Jones' Falls Branch has been cleaned out from the Northern Central Railway to the limit of back-water, in all about 4,500 cubic yards of material being removed. Also about 6,000 feet on both banks of the Jones' Falls arm of the lake have been rip-rapped. The banks made by deposits of material dredged in previous years have also been cleaned and dressed.

Cleaning Up Distribution System.

The work of systematically cleaning up the distribution system, which we started in 1901, was continued in 1902. Different sections of the city are taken in turn and all old small mains are cut out of service; the service pipes and fire plugs which these small mains supplied are transferred to newer and larger mains in the same street; all dead ends of mains are connected up where possible, and where not possible, blow-off valves are inserted; all pockets which collect sediment are cut out where possible; crooked connections are straightened out; new valves are inserted to make shorter shutoffs, etc. About 80,000 feet of 1½, 2, 3 and 4-inch pipe, which was badly corroded, choked up with sediment, and constantly leaking, was cut out of service last year, and about 2,000 services were transferred from this pipe to larger

mains. Also about 70 dead ends of mains were connected up. In this way the service has already been immensely improved in the central, southern and southeastern sections of the city. Also the work of this Department has been thereby greatly facilitated and economized, by making shorter and easier shut-offs in the system, and saving in both the cost of repairs to the old mains and in the amount of water wasted to keep them clear of sediment.

Improved Valves and Fire Hydrants.

Designs and patterns for modern valves and hydrants, to be a standard for the Department, have been completed and some of them have already been installed. The new valves are much lighter, cheaper, better made, and in every way a great improvement on the old style valve. The new hydrants are a great improvement on the old style hydrants now in service, in that they are much stronger made, have a much larger capacity, have no frost cases to be lifted off, have a drip-valve which will prevent water from escaping under pressure, and have interior working parts that can be removed and repaired without necessitating the digging up of the hydrant. We also now have for the first time in this city a hydrant with a double steamer nozzle which will enable two fire engines to draw from it at the same time. This hydrant has been thoroughly tested by the Fire Department and found to be entirely satisfactory. These hydrants will be placed all over the business and manufacturing sections of the city, and will enable the Fire Department to concentrate the fire fighting force in half the area now covered in any big fire and to use much shorter hose, thus cutting down materially the pressure lost in hose friction.

New Store House.

For some time it has been evident that our facilities for storing small supplies at Gay street yard were very limited; that the machine-shop had become so littered up with small

stores as to considerably hamper the work; that other material stored under open sheds in the yard could not be properly protected; and that the small stores at the yard were so scattered as to render correct inventories difficult to obtain. Consequently we decided to build a new store-house on vacant land at the yard. Plans were prepared in the Water Engineer's office and a contract was let in November to James W. Arthur for $29,952.00. The building will be of masonry and steel, with tile roof, and will be fire proof throughout. The construction of the building is well under way. When it is completed we will not only have plenty of room for all small stores, have them properly segregated and protected, but we will also have in the building a modern paint shop and a large toilet room for the yard-men, with all conveniences, including sanitary lockers.

Blacksmith Shop.

The construction of the new store-house made necessary the removal of the blacksmith shop to another location. Consequently it has been placed on new foundations just a short distance south of its old location. Considerable improvement has also been made in the shop by installing a new blower run directly by the machine shop engine.

New Shop Machines.

Contracts were made in December for additional lathes and planers for the machine shop. As soon as these and other improved machines which we propose to get are in service, and some of the present antiquated machinery is out of the way, the capacity of the shop will be considerably increased, and work can then be done more economically and rapidly than now.

Improvements at Pumping Stations.

At Mt. Royal Pumping Station the coal conveyor has been so changed by removing the driver-engine from the basement to the upper line above the boilers, and by installing roller curves at two turns instead of the old rigid curves, that the expense of repairs has been reduced from a very large amount to almost nothing, the amount of power required to operate the conveyor has been greatly reduced, and its capacity has been about doubled. Considerable of the defective main and auxiliary steampipe work in the boiler-room has also been replaced and repaired, thus cutting down the amount of wasted steam to a minimum. At the Eastern Pumping Station the old 10,000,000 gallon pump, which has been in continuous operation for ten years with very little repairs, was thoroughly overhauled, and all worn parts renewed, so that it is now in condition for effective service.

Venturi Meters and Recording Gauges.

We have been for some time dissatisfied with the present method of determining the data with relation to the flow of our sources of supply and the water consumption, and we have made plans to secure this information as accurately as possible by recording gauges and meters. Automatic recording gauges have been installed in the gate-houses at Hampden Reservoir and Lake Montebello, and gauges are now being made for Lake Roland and Lock Raven. Contract was made in June with the Builders Iron Foundry of Providence, R. I., for three thirty-inch and two forty-inch Venturi meters. These are now being inserted on the mains leading from Druid Lake and Lake Clifton to the city. As soon as these gauges and meters are all in operation we will be able to determine accurately what we can now only approximately estimate, as to the flow of the two sources of supply (Jones' Falls and the Gunpowder River), the amount of water sent from them to the city, and the actual rate and amount of water consumption for any hour, day, week, month or year,

in any part of the city. This information will be of great value to the Department in planning for future improvements, and also it will furnish much needed accurate data for the Sewerage System.

Improvements in Meter Work.

When we came into office in 1900, we found all work in relation to meters in this Department being carried on by a Meter Division. This Division we at once abolished, and we transferred the necessary meter work to other Divisions; the technical and inspection work to the Engineering Division, the mechanical work to the Mechanical Division, and the construction work to the Construction Division. We then started to systematize the work of testing, repairing, inserting, reading and inspecting meters, and of recording all information in relation to them, with the object of cutting off all useless labor and duplication of records, cutting down the time taken to read meters, making more prompt repairs, re-calibrating all old meters, making standard meter settings, reducing complaints and disputed bills to a minimum, getting accurate records and valuable data in a concise and compact shape, and in general, making the work as economical and efficient as possible. The systematizing of this work was completed early in the year, and we are now able to show the beneficial results. Our two inspectors now read in ten days 400 more meters than it took four inspectors six weeks to read under the old arrangement. Formerly every quarter inspection would show from 350 to 400 meters out of order; now, with about 400 more meters in service, the number out of order is only from 50 to 75, and this number is being constantly reduced. Formerly every quarter's reading would produce from 50 to 150 disputed bills; now there are rarely more than four or five. Our searching inspection of metered properties has added to our revenues hundreds of dollars for water which formerly was not paid for. We have recalibrated 175 old Worthington

meters that had been in service for years without repairs or recalibration and which under registered from one to fifty per cent., and have thereby increased our revenues from those meters by over $4,000.00 a year. The cost of inserting metered supplies has been considerably decreased, with a better quality of material in use and a better arrangement of fixtures. Our card index now gives us in a complete and concise form all necessary information in relation to meters in shape for instant reference and comparison.

Meters in Place of Flat Rates.

Finding that great discrepancies existed in the flat rates fixed by former Boards for the use of water by different properties of exactly the same class, we made a very careful investigation of the matter and concluded that the best and perhaps the only way in which these discrepancies could be adjusted satisfactorily, and with exact justice, was to put them under meter. We have, therefore, classified all of these properties according to the nature of the building or business carried on, with the idea of taking a few of these classes each year and metering them until all are under meter. We, therefore, selected five of these classes for metering in 1902, namely: hotels, oyster houses, drug stores, bottling houses, saloons and livery stables. All of the work of installing meters on these properties, including the cost of the meter, is done without any expense to the property-owner.

Meter Ordinance for Charitable Institutions.

We also found upon investigation great discrepancies in the flat rates fixed by previous Boards for charitable institutions. Our attention was specially called to this matter by several such institutions petitioning us for a reduction of their water rents. Upon referring the matter to the City Solicitor we were advised by him that we had no authority to make special rates for such institutions. Believing that

all charitable institutions should receive some recognition from the city in shape of special concessions, we made a thorough investigation of the matter, and we came to the following conclusions: That concessions should be made to such institutions in proportion to the degree to which they are actually charitable, and that, as the great majority of such institutions use large quantities of water and have a great many water fixtures and a great deal of water pipe on their property, it would be better for their interests and for the interests of the Water Department that they should pay for all water used by actual measurement, so that there might be some check on useless waste and loss by leakage. These results could only be accomplished by putting all such properties under meter with a sliding scale of meter rates varied according to the proportion or degree to which the institution was charitable. Therefore, we prepared and had submitted to the City Council an ordinance on this line, giving recognition to all charitable, religious and educational institutions in the city in the shape of reduced meter rates. We respectfully urge the passage of this ordinance in place of the numerous ordinances fixing nominal flat rates now being considered by the City Council, for the reasons we have just mentioned.

Our system of recording, book-keeping and taking inventories is now perfected to a degree which will compare favorably with the best managed private corporations.

Abatement of Pollutions.

During the year we secured the abatement of 65 cases of pollution in the Water Shed. Data is now in the hands of the City Solicitor ready for legal action in two cases where property owners have refused to abate pollution. An injunction will be obtained at once, if possible, restraining them from allowing the pollution to continue. We believe that the pollution of our sources of supply should be stopped as

soon as possible, that it should be determined at once whether it is possible to compel the property owners to abate these pollutions at their own expense. If not, then we believe that the Water Department should as soon as possible arrange to have this work done at the expense of the city.

In conclusion, we desire to express our appreciation of the willing, loyal, energetic, intelligent and efficient manner in which all the heads of divisions and all subordinate employées of this Department have helped us to carry on the work and secure such creditable results as we have been able to achieve.

Alfred M. Quick, *President.*
Albert C. Tolson,
Merville H. Carter, M. D.
James T. Miller,
Wm. W. Varney.

Report of Auditing Division.

BALTIMORE, December 31, 1902.

MR. A. M. QUICK,
Water Engineer.

DEAR SIR—I desire to present herewith the report of the Auditing Division for the year ending the above date.

This Division during the year has kept the books of the Department, showing its accounts with outside parties and with other departments of the city government; has kept a record of all receipts and disbursements; has made up pay-rolls and paid off all employees; has ordered all materials, taken all inventories and kept stock ledgers; has kept a record of all work done on shop-orders, checked and compared all bills, drawn up all warrants, and has kept a record of all rents, insurance, etc.

Careful attention has been given during the year to the placing of all orders for supplies required by the Department not covered by contracts; competitive prices being always obtained (except for small emergency orders) and a saving of about $1,600.00 was affected by this practice.

Collections have been followed up very closely by correspondence, etc., and as a result, out of a total sales of old materials, etc., of $6,986.09 there only remains unpaid upon our ledgers $426.39, of which last named amount $422.56, according to the terms of sale, is not yet due.

The system of accounts inaugurated in 1900 has shown excellent results during the year just closed. This is due to a clearer understanding of the details by the book-keepers

and stock clerks, the difference in the stock of the Mechanical Division being only $120.78 out of a total stock of $116,000.38, and 41 cents out of a total stock of $8,434.00 at the Construction Division. When it is considered that other concerns allow a difference of $500.00 on a stock of $50,000.00, it will be seen that our method of keeping these accounts works very satisfactorily.

I present below the annual statements, showing the assets and liabilities of the Department, the gross receipts and total disbursements, the surplus, disbursements in each of our two appropriation accounts, and a statement of stock on hand December 31, 1902.

In conclusion, it again gives me pleasure to commend the employes of the Division for the able, intelligent and conscientious manner in which they have performed their respective duties, and their cheerful response to every request I have made of them.

Respectfully yours,

CHAS. W. NAGLE, *Auditor.*

STATEMENT OF EXPENDITURES FOR 1902.

CHARGED TO $2,000,000 LOAN.

Months.	Construction of Dredging Plant.	Light and Fuel	Labor.	Pumps and Boilers.	Tools and Hardware	Machinery.	Valves.	Wrought Iron Pipe and Fittings.	Bar Iron and Steel.	Lumber.	Rope and Packing.	Grease, Paints, Waste and Oil.	Rubber.	Current Expenses.	Sundries.	Totals.
December	$ 9,511 35															$ 9,511 35
January	11,345 09															11,345 09
February	7,400 85															7,400 85
March	19,223 01															19,223 01
April	12,852 24															12,852 24
May	12,892 05	$ 367 07										$ 2 05		$ 63 60		13,324 77
June		120 61	$ 602 21		$139 83						$66 89	197 29		3,317 50	$ 518 20	5,262 62
July	9,800 01	392 66	860 12		166 58	$ 1 80				$ 5 63	59 10	107 26	$266 25	130 43	1,571 80	13,503 94
August		596 55	420 15		1 72	14 00		$105 51	$2 45	15 60		67 11		87 81	172 70	1,729 58
September		110 77	1,343 75		14 78				5 64			77 37		6 00	26 79	1,921 10
October		396 26	1,560 67		10 41			13 00				176 56		3 02		2,189 62
November		344 42	1,380 02					1 30				213 44	22 72	12 00	60 99	2,035 79
December																
Totals	$85,321 60	$2,921 34	$6,586 10		$333 02	$18 80		$119 81	$8 09	$88 12	$59 10	$841 08	$288 97	$3,620 45	$2,350 48	$100,592 96

Months.	Charged to Water Engineer's Meter and Expense Accounts.	Charged to Water Engineer's Salary Account.
	Meters	Salaries.
December	$ 443 68	$ 6,817 00
January	525 32	6,672 40
February	125 10	6,652 49
March	732 10	6,671 35
April	1,086 82	6,624 30
May	845 16	6,649 18
June	62 55	6,559 90
July	325 57	6,560 90
August	3,326 34	6,553 54
September	4,770 55	6,584 90
October	1,247 59	6,572 90
November	7,239 26	6,530 90
December		
Totals	$20,730 14	$79,502 90

CHARGED TO WATER ENGINEER'S EXPENSE ACCOUNT.

Months.	Books, Stationery and Printing.	Drawing Materials.	Office Furniture and Fixtures.	Light and Fuel.	Cleaning Up at Lake Boland	Labor.	Hauling	Repairs to Steam Piping at Mt. Royal P. S.	Altering Conveyor at Mt. Royal P. S.	Pumps and Boilers.	Tools and Hardware.	Machinery.	Cast Iron Pipe.	Cast Iron Pipe Fittings.	Special Iron Castings.	Valves.	Wrought Iron Pipe and Fittings.	Service Pipe and Fittings.	Brass Castings.	Bar Iron and Steel.	Meters.	Lumber.	Lead.	Rope and Packing.	Grease, Paint, Waste and Oils.	Rubber.	Bricks, Stone and Cement.	Sand, Gravel and Ashes.	Asphalt Paving	Feed	Insurance.	Current Expenses.	Sundries	Store House at Gay Street Yard.	Totals.
December	$ 262 80			$ 2,415 32		$ 1,316 16	$ 64 81				$ 76 06	$ 303 75	$ 450 19	$ 1,325 83			$ 114 75	$ 57 15	$ 139 40			$ 165 01		$ 41 14	$ 308 27	$ 152 82		$ 75	$ 24 92	$ 73 27		$ 136 54	$ 229 09		$ 8,017 86
February	214 50		$ 17 12	3,522 37		13,302 81	4 89				273 46	361 25		812 57	$ 297 50		474 37	24 27	1 05	$69 47		124 62		39 52	465 28	174 29	$ 12 60		10 71	119 16	$113 50	783 33	124 24		21,345 18
March	145 11			1,761 11	$25 02	10,323 30	81 16		$ 930 00		149 20	22 95	6,261 30	416 89		$ 243 75	174 96	183 60	1,270 28	14 55		120 99		91 28	347 75					116 57	175 60	387 45	59 55		29,305 76
April	157 26	$11 20	36 95	1,795 28		11,857 78	81 51	$580 51	3 97		158 41	13 76	7,946 41	337 30		350 90	309 18	2,088 40	1,505 44	11 07		141 50			250 96	1 90	29 26	75	57 01	142 31		701 12	441 82		28,059 15
May	91 83	6 10		1,054 12		15,196 59	114 09	216 78		$12 60	386 58			1,326 88		80 70	107 82	2,865 97	914 64	26 38		45 09		32 90	419 79	32 50	68 72	2 00	37 68	223 83		345 55	825 96		22,464 09
June	166 11			5,886 74		18,864 80	117 31		170 00		616 69					156 75	886 83	685 00	730 95			144 51			208 39	105 11	141 35		221 92	156 31	95 00	982 97	644 02		29,582 05
July	90 22	3 00	96 50	3,476 60		15,182 46	375 56		460 00		376 47	118 88		3,648 22		501 79	80 38	330 00	186 43	35 00		53 86		20 52	539 56	90 14	46 32	1 00	343 65	190 28	241 42	846 27	391 35		27,741 68
August	91 59		64 00	1,558 73		15,101 43	63 61				318 72		2,928 49	779 80	283 53	231 95	90 07	2,318 44	652 03			308 13		68 63	216 83	263 88	74 28			191 02		896 61	1,431 51		27,936 11
September	47 04	16 00	19 15	1,089 16		19,108 13	74 61		33 83		251 38		2,445 56	139 23	240 91	257 62	703 58	1,667 46	261 91	36 16		290 23			328 15	33 00	40 16	1 50	35 29	222 80	22 50	928 00	482 49		32,097 27
October	59 37		50 60	2,721 86		15,071 60					256 15		1,525 09	553 96	517 21		51 44	1,375 22	12 80	56 49		312 30		44 20	176 51		44 05	1 25	17 18	378 11		1,144 76	503 65		24 830 29
November	118 68			4,936 78		19,884 24	367 16				315 22	419 90	4,198 26	803 73	715 54		223 70	548 12	3,163 49			177 15			376 73	7 10	93 25	18 75	62 65	297 71	85 50	1,153 28	52 70		39 577 47
December	213 76	12 11		2,053 57		15,372 94	228 22				304 78		8,567 56				525 50	104 14	1,233 18	563 03		38 07		111 05	210 46	271 37	75 10	18 75	118 87	176 90		517 02	776 12		37,656 88
Unclassified						15,673 67															$5,561 38													15,673 67
Totals	$1,668 60	$48 41	$284 32	$35,104 61	$25 02	$182,648 30	$1,599 29	$797 29	$1,597 80	$12 60	$3,403 12	$1,240 49	$35,122 86	$10,143 90	$2,054 69	$2,652 66	$3,325 64	$15,990 09	$6,586 27	$249 12	$5,561 38	$1,924 26		$461 24	$3,888 88	$1,132 11	$843 69	$44 75	$932 98	$2,238 68	$733 52	$9,142 90	$5,962 90		$387,282 50

DEPARTMENT OF PUBLIC IMPROVEMENTS—SUB-DEPARTMENT, WATER BOARD.

Statement of Assets and Liabilities to December 31, 1902.

Assets.	Accounts Receivable.	Tools and Machinery.	Furniture and Fixtures.	Horses and Wagons.	Mains Laid.	Land, Construction and Real Estate.	Sinking Funds.	Stock on Hand Dec. 31, 1902.
Water Board	$ 155,869 43	$22,414 25		$ 373 35	$4,197,571 78		$2,424,220 19	
Construction Division		6,804 75	$ 809 75	5,398 30				$ 8,434 41
Mechanical Division		12,651 63	117 10	1,392 15				115,872 79
Western Pumping Station		74,367 35	156 07	264 40		$ 53,577 00		
Eastern Pumping Station		86,045 97	215 95			{ 138,258 91 { 904 50		
Mt. Royal Pumping Station		135,066 34	1,017 93			240,891 00		
Machine Shop		10,629 57	169 10					
Lake Montebello		387 18	22 00	935 25		1,149,648 07		883 54
Lake Clifton		68 00		12 00		729,832 63		
Mt. Royal Reservoir		19 05				133,162 35		
Druid Lake		178 05	13 00	253 95		1,334,573 92		
Hampden Reservoir		142 15				226,043 53		
Western High Service Reservoir		12 00				112,518 57		
Guilford Reservoir		43 40	3 00			162,671 24		
Loch Raven		115,105 74		2,223 25		880,537 64		
Water Shed Patrol				45 00				
Gunpowder Conduit						1,779,610 24		
Lake Roland		525 45	25 00	283 75		378,606 20		
Jones' Falls Conduit						569,043 35		
West Arlington Standpipe		79 55				41,732 74		
Engineering Division			1,048 25					436 65
Auditing Division			231 36					60 00
Total accounts receivable	$ 155,869 43							
Total tools and machinery	464,540 43	$464,540 43						
Total furniture and fixtures	3,828 51		$3,828 51					
Total horses and wagons	11,181 40			$11,181 40				
Total mains laid	4,197,571 78				$4,197,571 78			
Total land, construction and real estate	7,931,611 89					$7,931,611 89		
Total sinking funds	2,424,220 19						$2,424,220 19	
Total stock on hand	125,687 39							$125,687 39
Total assets	$15,314,511 02							

Liabilities.	Accounts Payable.	Loans.
Water Board	$ 12,695 67	$8,500,000 00
Total accounts payable	$ 12,695 67	
Total loans	8,500,000 00	$8,500 000 00
Total liabilities	$8,512,695 67	

Total assets	$15,314,511 02
Total liabilities	8,512,695 67
Excess assets over liabilities	$ 6,801,815 35

SUMMARY OF RECEIPTS FOR 1902.

Division.	ITEMS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Construction.	New services inserted	$900 00	$ 326 00	$1,504 00	$2,072 00	$2,040 00	$1,942 00	$1,614 00	$1,674 00	$2,462 00	$2,030 00	$2,102 00	$1,046 00	$19,712 00
	Meter supplies inserted	348 21	1,451 29	975 16	1,061 51	852 20	1,594 56	358 22	593 62	64 37	543 33	507 81	394 64	8,744 92
	Repairs	199 51	3,101 34	303 21	635 63	565 87	1,084 80	595 42	1,146 11	357 42	1,193 07	1,165 41	632 37	10,980 16
	Sand, etc													
	Totals	$1,447 72	$4,878 63	$2,782 37	$3,769 14	$3,458 07	$4,621 36	$2,567 64	$3,413 73	$2,883 79	$3,766 40	$3,775 22	$2,073 01	39,437 08
Mechanical.	Scrap					$ 788 81			$484 03				$ 579 31	$1,852 15
	Old Brass					317 03			103 12					420 15
	Pipe and castings			$ 30 56	$1 69	38 22	$5 00	$ 33 25	9 35		$124 95	$ 97 47	665 78	1,006 27
	Coal													
	Miscellaneous	$12 27	$143 62		19 95	303 20	13 82	79 61	76 61	$14 35	70 82	234 21	1 50	969 96
	Totals	$12 27	$143 62	$30 56	$21 64	$1,447 26	$18 82	$112 86	$673 11	$14 35	$195 77	$331 68	$1,246 59	$4,248 53
County.	Hay, fodder, etc	$408 66	$203 85	$ 79 40	$ 37 08	$ 16 55	$10 93	$20 00	$195 80	$15 00	$ 90 43	$101 44	$109 60	$1,288 74
	Horses, mules, wagons and harness											1 00		1 00
	Wood and coal	28 25		15 50	6 75	1 00		7 75	526 78	18 50	17 50	17 65	18 40	658 08
	Sand					3 25		80		50	2 50	2 60	2 20	11 85
	Ice		20 44	76 38		92 09			10 14				18 09	217 14
	Rent	18 00	118 00			31 00	18 00	18 00	18 00	18 00	183 00	98 00	68 00	588 00
	Totals	$454 91	$342 29	$171 28	$43 83	$143 89	$28 93	$46 55	$750 72	$52 00	$293 43	$220 69	$216 29	$2,764 81
	Grand totals	$1,914 90	$5,364 54	$2,984 21	$3,834 61	$5,049 22	$4,669 11	$2,727 05	$4,837 56	$2,950 14	$4,255 60	$4,327 59	$3,535 89	$46,450 42

SUMMARY OF DISBURSEMENTS FOR 1902.

ITEMS.	Disbursements.												Totals.
	1901 December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Books, stationery and printing	$ 262 80	$ 214 50	$ 145 44	$ 137 26	$ 91 83	$ 166 11	$ 90 22	$ 91 59	$ 47 04	$ 59 37	$ 148 68	$ 213 76		$ 1,668 60
Drawing materials				11 20	6 10		3 00		16 00			12 11		48 41
Office furniture and fixtures		17 12		36 95			96 50	64 00	19 15	50 60				284 32
Light and fuel	2,445 32	3,522 37	1,764 11	1,795 28	1,054 12	5,453 81	3,897 21	1,951 39	4,645 71	3,168 63	5,333 04	2,997 99		38,028 98
Cleaning up at Lake Roland			25 02											25 02
Labor	1,345 16	13,362 81	10,323 30	11,857 78	13,196 59	18,864 89	15,784 67	16,103 85	20,107 56	16,415 35	21,444 91	16,753 86	$13,673 67	189,234 40
Hauling	64 84	4 89	81 16	81 51	144 06	117 31	373 56	63 64	73 64		367 16	228 22		1,599 99
Repairs to steam piping, Mt. Royal P. S.				380 51	216 78									597 29
Altering conveyor, Mt. Royal P. S.			930 00	3 97		170 00	460 00		33 83					1,597 80
Pumps and boilers					12 00									12 00
Tools and hardware	76 06	273 46	149 20	158 41	386 58	616 69	516 30	485 30	253 10	250 93	325 33	304 78		3,796 14
Machinery	303 75	361 25	22 95	13 76			118 88	4 80	14 00		419 90			1,259 29
Cast iron pipe	450 19		6,261 30	7,946 41				2,928 49	2,445 56	1,525 09	4,998 26	8,567 56		35,122 86
Cast iron pipe fittings	1,325 83	812 57	416 89	337 39	1,326 88		3,648 22	779 80	139 23	553 36	803 73			10,143 90
Special iron castings		297 50						283 53	240 91	517 21	715 54			2,054 69
Valves			243 75	350 90	80 70	136 75	501 79	231 95	257 62		323 70	525 50		2,652 66
Wrought iron pipe and fittings	114 75	474 37	174 96	309 18	107 82	586 83	80 38	90 07	809 09	31 44	591 12	105 44		3,475 45
Service pipe and fittings	57 15	24 27	183 60	2,088 40	2,865 97	683 00	330 00	2,318 44	1,667 46	1,375 22	3,163 40	1,233 18		15,990 09
Brass castings	139 40	1 05	1,270 28	1,505 44	914 64	350 95	186 43	652 03	261 91	12 89	728 22	563 03		6,586 27
Bar iron and steel		69 47	14 55	11 07	26 38		35 00		38 61	62 13				257 21
Meters	443 68	525 32	125 10	732 10	1,086 82	845 16	62 55	325 57	3,326 34	4,770 55	1,247 59	7,239 36		20,730 14
Lead														
Lumber	165 01	124 62	120 99	144 50	45 09	144 51	120 55	313 76	305 83	312 30	177 15	38 07		2,012 38
Rope and packing	41 14	39 52	91 28		32 90		29 52	127 73		44 20		114 05		520 34
Grease, waste, paints and oil	308 27	405 28	347 75	250 96	419 79	310 64	736 85	324 09	395 26	253 88	553 29	423 90		4,729 96
Rubber	152 82	174 29		1 00	32 50	105 11	90 14	530 13	33 90		7 10	294 09		1,421 08
Bricks, stone and cement		12 60		291 26	68 32	141 35	46 32	74 28	40 16	41 05	53 25	75 10		843 69
Sand, gravel and ashes	75			75	2 00		1 00		1 50	1 25	18 75	18 75		44 75
Asphalt paving	24 92	10 71		57 01	37 68	224 92	343 65		35 39	17 18	62 65	118 87		932 98
Feed	73 27	119 46	116 57	142 31	223 85	156 31	199 28	191 02	223 89	378 11	237 71	176 90		2,238 68
Insurance		113 50	175 60			95 00	241 42		22 50		85 50			733 52
Current expenses	436 54	783 33	387 45	701 12	345 55	1,046 57	4,163 86	1,027 04	1,035 81	1,150 76	1,156 30	529 02		12,763 35
Sundries	229 69	124 24	59 55	441 82	825 96	644 02	909 55	3,003 11	655 19	530 44	52 70	837 11		8,313 38
Storehouse at Gay street yard														
Construction of Dredging Plant	9,511 35	11,345 09	7,400 85	19,523 01	12,852 24	12,892 05		9,800 01						83,324 60
Salaries	6,817 09	6,672 40	6,652 49	6,674 35	6,624 99	6,649 18	6,559 99	6,609 99	6,553 54	6,584 99	6,572 90	6,530 99		79,502 90
Totals	$24,789 78	$99,885 99	$37,484 14	$55,985 61	$43,028 14	$50,401 16	$39,626 84	$48,375 61	$43,699 73	$38,106 93	$49,587 88	$47,901 64	$13,673 67	$532,547 12
Less amount received for installing meters														15,168 76
														$517,378 36

Total amount disbursed for meters	$20,730 14
Less amount received for installation, as above	15,168 76
Amount charged to Water Engineer's Exp. Acct.	$ 5,561 38

STATEMENT OF SURPLUS ACCOUNT FOR YEAR ENDING DECEMBER 31, 1902.

Receipts:

By amount received from Water Rents	$565,672 92	
Less refunded	1,014 30	
	564,658 62	
Less discount	14,373 41	$550,285 21
" interest on back water rents		4,245 51
" meter rents		264,283 06
" amount from new meters installed		9,522 38
" turn offs		1,855 00
" vacancies		364 00
" plumbing bills		28,871 42
" wages returned		13 00
" rents and sales of materials		6,973 09
		$866,412 67

Disbursements:

Water Engineer's Department—salaries	$ 79,502 90	
" " " expenses	346,889 88	
Collector Water Rents and Licenses—salaries	22,483 62	
" " " expenses	381,331 19	830,207 59
Gross Surplus		$ 36,205 08
Amount carried forward to 1903 to apply on contracts heretofore made		26,088 17
Net surplus to Commissioners of Finance.		$10,116 91

Report of Engineering Division.

Baltimore, Md., January 1, 1903.

Mr. Alfred M. Quick, *Water Engineer.*

Dear Sir:—I herewith submit my report of the operations of the Engineering Division for the year ending December 31, 1902.

During the year this division has been engaged in its usual work of preparing plans for work done by the Construction and Mechanical Divisions, preparing plans for and supervising work performed for the department by contractors, and making the usual inspections, tests, etc.

The work of surveying cases of pollutions on the Gunpowder and Jones' Falls watersheds has been continued; thirteen cases have been surveyed and platted and the plats filed for reference.

The dredging plant at Loch Raven was completed in May by the Atlantic Gulf and Pacific Company, contractors, and the ten days' trial run, which was provided for in the contract, was begun on May 21st and run until the 31st.

The plant was guaranteed to remove 3,500 cubic yards of material per day of ten hours, and it was found after the test that an average of 4,900 cubic yards per day had been removed, or an excess of 40 per cent. over the guarantee. The plant was accepted and turned over to the custody of the Superintendent of the County Division.

Early in the year plans were prepared for changes in the Mount Royal Pumping Station building, made necessary by proposed changes in the coal conveyor. The alterations were afterwards made by contract, under the supervision of this division.

Extensive changes were then made in the coal conveyor, which greatly increased the efficiency of this machinery. These changes were suggested by the C. W. Hunt Company, who furnished an expert to superintend the work.

At the time of my last report this division had prepared plans for extensive improvements and repairs to the steam pipe at Mount Royal Pumping Station. These plans were executed by the Mechanical Division, and since that time the expense and nuisance of escaping steam around the station has been entirely obviated.

The work of drilling a new artesian well at the City Quarantine Station, which I reported in progress in my last report, has been completed and the machinery removed to the new location. The plant has since been working in a satisfactory manner.

After much careful study and experimenting, the designs for a new single and double nozzle fire hydrants have been completed, and six of the double nozzle style have been made at the department shop and erected at suitable points by the Construction Dvision.

On July 10th at 5 o'clock A. M. one of these hydrants, located at the northeast corner of Holliday and Saratoga streets, was tested by the Fire Department, under the direction of Chief Engineer George W. Horton. Engine Companies Nos. 4 and 6 were used. No. 4 reached the ground first, connected to the hydrant, and by using two discharge outlets and a siamese connection, threw a heavy stream westward on Saratoga street. While No. 4 was in full operation, No. 6 connected and began operations without interfering in any way with No. 4. In closing the test one engine was withdrawn without interfering with the other. During the test both engines were worked to their full capacity without any apparent lack of water. With the business sections of the city properly supplied with these hydrants, I do not believe any city in the country will be better equipped for concentrating its fire fighting apparatus around a fire than this city.

The appearance of the double nozzle style is not all that could be desired, as its form had to be designed to accommodate the interior working parts. The single nozzle style will present quite a handsome appearance and be a great improvement over those now in use.

Gauges for automatically registering the height of water in reservoirs were purchased and placed in service at Lake Montebello and Hampden Reservoir.

In selecting an instrument to be used for the same purpose at Loch Raven and Lake Roland, no instrument on the market was found to be exactly suited for the purpose. The one made by Mr. Julian P. Frieze, of this city, was given an extensive trial, and an order given for two special instruments to be made to suit the service. These are now in process of construction.

On July 21st, a contract was made with the Builders' Iron Foundry, of Providence, R. I., for furnishing the department with two 40-inch and three 30-inch Venturi meters.

The Venturi meter is an ingenious device for measuring large quantities of water. Its operation is due to the difference of pressure in two parts of a contracting and diverging tube, when a current of water is flowing through it.

The meter consists of two parts, the tube through which the water flows, and the register, which sums up and indicates on a dial the quantity of water that has passed through the tube.

On January 10th I visited the works of the Builders' Iron Foundry to gain all possible information as to the construction and operation of these meters. I also extended my visit to the city of Boston to see them in operation on the water mains of that city.

On November 20th I again visited the works to inspect the meters under contract for the department.

The two 40-inch meters will be placed on the 40-inch gravity mains supplying water from Lake Clifton to the city, and the three 30-inch ones on the mains supplying water to the city from Druid Lake.

At Druid Lake two of the registers will be placed in the lower gate house, and one in a vault or house to be built for the purpose.

A vault is now in course of construction at Lake Clifton for the 40-inch registers.

The registration of these meters and the amount known to be pumped will show the exact amount of water consumed by the city in any given time.

Plans and specifications were prepared for a fireproof storehouse at Gay street yard, and on November 28th a contract was made with Mr. James W. Arthur for the erection of the building. This work is progressing very slowly at this time, owing to unfavorable weather conditions. When completed this building will provide ample storage facilities for all materials used by the department which require indoor storage. There is also provided in the basement a large toilet and locker room for the use of the men employed about the yard.

The building was designed to conform as near as possible in architectural style to the adjacent buildings in the yard.

Plans and specifications were prepared for a large hay barn at the upper end of Loch Raven, and a contract let to Mr. John A. Sheridan for its erection. The building was completed and turned over to the County Division in July.

Plans and specifications were also prepared for a coal bin and wharf at Loch Raven; to be used in connection with the dredging, and a contract let to Messrs. Insley & Redding. The work was completed and turned over to the County Division in July.

A great deal of time and study has been devoted to preparing preliminary plans and estimates of cost for a new high service reservoir, to be located in the western or northwestern section of the city, at an elevation of 350 feet above mean tide. Every available site has been studied, and the results, when tabulated, will be delivered to the Commission having in charge the purchase of the site. It would be

difficult to say how much time was saved to this department in making these estimates by the use of the topographical maps of the city, from which all of the data relating to location and elevation were taken.

During the year only three changes were made in the service areas, and these were of a minor character, all of the important changes having been previously made.

All the meters in the service have been regularly inspected, quarterly readings taken, and the results turned over to the Collector of Water Rents and Licenses. The system adopted in 1901 for the management of the meter work is still continued, and as the inspectors become familiar with its workings they are enabled to cover the routes in less time. During the year some minor changes were made in the arrangement of the routes, which saved several days in the time required to take the quarterly readings. Very little of my personal attention is now required by this branch of the work, as it is ably looked after by the clerk and inspectors, who have the work well in hand.

The meter testing apparatus has been almost entirely rebuilt and improved to such an extent that I doubt if any Water Department in this country is as well equipped for testing meters as this Department.

The practice of testing every new meter received from the manufacturers has been continued during the year, and all old meters repaired have received a final adjustment and test in the testing room.

During the year one hundred and five old Worthington meters, which have been in service a number of years without repairs, were taken out and repaired at the expense of the Department. Seven of these meters were found to register correctly. Two over registered four per cent. each. Twenty-nine failed to register at all. Sixty-seven under registered from two to fifty-one per cent.

The repairs cost the Department $1,603.50. The earnings of these one hundred and five meters for the year 1901 was $19,205.92.

With these meters all in proper working order, and assuming that the same amount of water per annum will be used in the future as in the past, there will be an increase in revenue of $2,534.04, and deducting $1,603.50, the cost of the repairs, shows a net gain in revenue to the Department for one year of $930.54.

I again take pleasure in reporting that all of the employes of this Division have performed their duties well and conscientiously, and have responded cheerfully to every request I have made of them.

GENERAL OPERATIONS.

1. Laying out lines of large mains required for better circulation of water throughout the system, and smaller lines for supplying applicants for service connections, and for the general improvement of the water supply.

2. Estimating quantites of pipe, special castings, valves, etc., for laying mains.

3. Keeping a record of all straight pipe made for the Department; of the amount of pipe, special castings and valves, ordered and shipped; and shipment, transfer, receipt and unloading of all cars of such material.

4. Locating all new service and meter supplies put in during the year, and keeping a record of the status of all service and meter supplies.

5. Locating all branches, valves, connections and fire hydrants inserted during the year.

6. Inspecting and reporting to the Collector of Water Rents and Licenses as to properties on joint private service pipes. Investigating illegal connections and supplies.

7. Inspecting the general conditions of all meters in service, taking quarterly statements of meters and indicators, making drawings of the locations of new meters installed, testing new and old meters, testing indicators for disputed bills, and entering up meter accounts.

8. Plotting on the maps all mains laid in 1902, making plans for the extension of high and middle service areas.

9. Making plans for work done at Mount Royal Pumping Station, as follows:

Repairs to steam mains.
Details of sash, frames, etc., in ventilator bay.
Brass oil shields for dynamo engine.
6-inch copper bends for steam pipe.
Plans for new location for conveyor engine room.
Plan for setting ventilator fan in crusher pit.
Plan for arranging lockers in toilet room.
Cast iron casing for I beams in ash pits of boilers.
Electric sign for front of building.

10. Plans for work done at Gay street yard, as follows:

Plans, elevations, etc., for new store house.
New foundations for blacksmith shop.

11. Plans for work done at Loch Raven, as follows:

Plans and details for hay barn. Coal bin and wharf.
Coal bins and trestle on M. & P. R. R. at Loch Raven Station.
Guide for float of recording gauge in gate house.
Stop planks for influent gate chambers.
Reducer for shore pipe of dredging plant.

12. Miscellaneous plans and drawings, as follows:

Plans for sewage systems for Towson, Lutherville, Phœnix and Warren.
Type of septic tank for treating sewerage.
Plans, details, etc., for single nozzle fire hydrants.
Table, guides, etc., for recording instruments at Lake Montebello and Hampden Reservoir.
Float guides for recording instruments at Lake Roland.
Special valve for meter-testing machine.
Alterations in department valves.
Plan for carrying 10-inch pipe over Central avenue sewer, between Pratt and Granby streets.

Special valve-seat wrenches for fire hydrants.
Opening wrenches for fire hydrants.
Standard meter vaults.
Carrying case for recording pressure gauge.
Six-inch and 10-inch pipe specials.
Setting for two Venturi meters at Lake Clifton.
Settings for Venturi meters at Druid Lake.
Cross sections of streets showing standard service connections.
Cast iron pipe plugs.
Special connections for eastern upper service at Western Pumping Station.

13. Engineering work, as follows:
Surveys for thirteen cases of pollution on Jones' Falls and Gunpowder watersheds.
Setting grades for new paths at Hampden Reservoir.
Survey for coal bin at Loch Raven.
Survey for coal bin and trestle at Loch Raven Station.
Survey for a water supply to keeper's house at upper end Loch Raven.
Survey for filter bed at Towson.
Levels for proposed 10-inch pipe line in Tenth street and Chesapeake avenue.
Levels and lines for storehouse at Gay Street Yard.
Levels and location of vault in Washington street at Clifton Park.
Survey of North avenue, between McMechen and John streets.
Surveys for setting Venturi meters at Lake Clifton and Druid Lake.
Monthly estimates of dredging done at Loch Raven.
Supervising trial run of dredging plant and estimating quantity of material removed.
Investigations and estimates in connection with proposed new high service reservoir.

14. Preparing specifications and contracts as follows:
Alterations Mount Royal Pumping Station.
Rotary meters.
Hay barn at Loch Raven.
Coal bin and wharf at Loch Raven.
Coal for city departments.
Thirty and forty-inch Venturi meters.
Sixteen and thirty-inch lathes.
Thirty-inch planer.
Storehouse at Gay street yard.
Vault for Venturi meters at Clifton Park.
General revision of specifications for department supplies for 1903.

15. Resume of the work done:

1902	New Branches Located.	Valves Located.	Service Connections Located.	Plumbing Connections Inspected.	Private Pipe Inspections.	Fire Hydrants Located.	Meter Supplies Located.	Meters Read.	Meters Tested.	Special Inspections of Meters and Indicators.	Plans made for Extension of Mains.	Miscellaneous Plans and Drawings.	Complaints Investigated.
Jan ...	7	10	115	59	60	9	9	73	66	227	8	7	61
Feb ...	1	1	73	83	43	1	5	14	28	165	35	4	99
March .	15	28	182	87	53	6	15	1898	34	112	27	6	101
April ..	33	47	246	83	38	6	15	62	68	198	9	7	172
May . .	40	58	247	113	53	3	17	24	65	67	28	2	128
June ..	58	77	166	75	39	3	6	1904	64	44	38	3	123
July . .	38	46	196	91	....	2	62	81	46	56	19	6	115
August	36	62	210	87	5	3	52	47	86	162	19	18	108
Sept ...	29	64	302	108	....	2	70	1964	152	116	42	6	145
October	12	23	264	100	2	1	90	32	98	94	17	12	121
Nov ...	26	47	214	93	....	6	55	29	56	49	21	10	95
Dec ...	13	29	99	64	....	5	53	2034	160	32	12	7	60
Totals	308	492	2314	1043	293	47	450	8162	923	1322	275	88	1328

Respectfully submitted.

ROBERT L. CLEMMITT,
Assistant Engineer.

Report of Construction Division.

BALTIMORE, January 22, 1903.

Mr. A. M. QUICK, *Water Engineer.*

DEAR SIR—I respectfully submit herewith my report of the work of the Construction Division for the year 1902.

The cost of laying pipe per lineal foot on extension of mains for 1902 has increased owing to the prices on material, and is as follows:

3-inch pipe, .02 7/10c.; 4-inch pipe, .00 7/10c.; 6-inch A pipe, .01 7/10c.; 6-inch B pipe, .03 9/10c., and 10-inch A pipe, .00 6/10c. more per foot.

A comparative statement of new service connections inserted during the year 1901 and 1902 will show an increased profit for 1902, also a reduction in labor cost per service.

	1901.	1902.
Number of services	2,057	2,051
Labor per service	233	207
Number of feet lead lined pipe	33,299	32,185
Cost per lineal foot	$ .56 15/100	$ .55 51/100
Amt. rec'd for inserting services	$20,330 00	$19,724 00
Cost of inserting services	18,809 85	17,864 00
Profit	$1,520 15	$1,859 89

Respectfully submitted.

GEORGE R. TRUELOVE,
Supt. Construction Division.

NEW MAINS AND MAINS CONNECTIONS, NEW VALVES, HYDRANTS AND FOUNTAINS.

Blue Print Number.	Location.	Size in inches.
01492	Alley n. from North ave., w. of Hopkins ave..	2-in. connection
01788	Monument, Clark and Graves streets.....	6-in. connection
01852	Eager street, west of Chester street.....	6-in. connection
01853	Wolfe and Eager streets.....	3-in. connection
01854	Washington and Eager streets.....	6-in. connection
01869	German, Mercer and Grant streets.....	8-in. connection
01870	Light street, bet. Pratt and Balderston streets..	6-in. main
01878	Baltimore street, between Chesapeake street and Eastern City Limits.....	6-in. main
01889	O'Donnell's Wharf and Wood street	10-in. connection
01890	South street and Guilford alley.....	6-in. connection
	South street and Exchange Place	6-in. connection
01891	Holliday st., bet. Baltimore and Second sts....	6-in. connection
01898	Chesapeake, between Fairmount avenue and Philadelphia road	6-in. main
01905	Wolfe st. and alleys bet. Biddle and Chase sts..	4-in. connection
01908	Howard st., bet. Monument and Madison sts..	6-in. main
01910	Charles and Twenty-fifth streets (bill)...	2 2-in. sewer blows
01911	Light and Wells streets.....	10-in. main
01912	Castle st., bet. Bohemia Court and Fayette st..	6-in. main
01913	Park avenue and Whitelock street	6-in. main
01914	Oakfield avenue, between Main avenue and Liberty road.....	6-in. main
01916	Light street, between Pratt and Lee streets....	10-in. main
01917	Hanover street, between Pratt and Hill streets.	12-in. main
01927	Belvidere street, south of Oliver street	6-in. main
01928	Alley on Oliver street, west of Wolfe street	4-in. connection
01929	Preston street, Hubbard alley and Eden street.	4-in. connection
01930	Hoffman and Ensor streets, and alley north of Preston street	3-in. main
01931	Eastern avenue and Ninth street	8-in. connection
01932	Holbrook st., north and south from Preston st.	6-in. main
01934	Fayette street, bet. Front street and the bridge.	6-in. main
01936	Alley south of Preston street, and west from Hopkins avenue.....	3-in. main
01938	Hoffman and Chapel streets, and alley south of Hoffman street.....	3-in. main
01940	Alley south of Preston street, east of Dallas and Bond streets	2-in. main

Blue Print Number.	Location.	Size in Inches.
01945	Alley south of North ave., and east of Ensor st.	2-in. blow
01946	Eden street, bet. Biddle and Preston streets ...	6-in. connection
	Alley north of Biddle street, east from Eden st.	6-in. connection
01948	Lanvale and Bethel streets.....	4-in. main
	Alley north of Lanvale st. and east of Bethel st.	
01951	Biddle street, from Eutaw street to Linden avenue and Jordan alley.....	6-in. main
01953	Alley s. of Chase street and east of Forrest st..	2-in. connection
	Alley east of Clifton st. and north of Eager st..	3.in. connection
01954	Biddle street and Cemetery lane and alley west of Broadway.....	4 and 6-in main
01955	Federal and Eden streets.....	6-in. connection
01956	Wells street and Belt avenue.....	Transferred plug
01957	Dallas street, between Eager and Chase streets.	6-in. main
01959	Alley north of Eager street, west of Broadway	3-in. main
01960	Alley south of Lafayette ave., w. of Bond st...	4-in. main
01962	Third and Hickory avenues	Transferred plug
01963	Union avenue and Falls road.....	5-in. plug
01964	Hickory and Roland avenues.....	6-in. main
01965	Lanvale street, west of Mount street.....	6-in. main
01967	Eagle street, east from Monroe street.....	6-in. main
01968	Hillman street, north from Preston street.....	4-in. main
01969	Wilcox street, north from Preston street.....	4-in. main
	Alley east of Valley st., north from Preston st.	
01970	Alley east from Spring street, north of Oliver st.	3-in. main
01972	Alley east from Stockton st., n. of Raborg st...	4-in. main
01973	Lehman and Wagon alleys and alley south of Wagon alley and east from Arlington ave....	2-in., 3-in., 4-in. main.
01976	Carrollton av., bet. Saratoga st. and Wagon al.	6-in. connection
01978	Between Mulberry and Franklin and Poppleton and Fremont streets.....	6-in. connection
01979	Bruce and Fayette streets.....	4-in. connection
	Alley n. of Fayette and e. from Bruce street...	
01980	Alley n. of Lexington st. and w. from Mount st.	3-in. main
01983	Alley w. of Fremont st., n. from Harmony lane	2-in. main
01984	Parrish alley and alleys bet. Saratoga and Lexington streets.....	3-in. connection
01985	Davis street, between Read and Eager streets..	6-in. main
01986	Duncan alley, bet. Monument and Madison sts.	6-in. main
01987	Bruce street, south of Lanvale street.....	4-in. main
	Alley west of Bruce street on Lanvale street...	
01988	Dark lane, bet. St. Paul and Courtland street..	6-in. main

Blue Print Number.	Location.	Size in inches.
01990	Preston st., bet. Park av. and Jenkins alley, and alley s. of Preston st. e. from Park ave..	6-in. connection
01994	Clemm st., bet Ludlow and Burrough streets...	6-in. main
01997	York st., William st. and Armistead lane, between Light and Johnson streets.....	6-in. main
02002	German st., between Fremont and Paca streets.	10-in. main
02005	Jackson st., bet. Randall and Barre streets.... Belt street, north from Randall street.....	6-in. main
02009	Alley rear e. s. Parkin st., bet. Ramsay and Pratt	4-in. main
	Ramsay st., between Scott and Bartlett streets.	6-in. main
02012	Druid avenue, south from Third avenue.....	6-in. main
02014	Light st., between Pratt and Lee streets (bill)..	4 2-in. hose connections.
02016	German and Arch streets.....	10-in. main
02018	Fait ave., bet. Chesapeake and Streeper streets. Streeper street, south from Fait avenue.....	6-in. main
02020	Appleton st., bet. Lanvale st. and Lafayette av.	6-in. main
02022	Harrison street, between Baltimore street and Fairmount avenue.....	6-in. main
02023	Broadway and Oliver street ..... Hoffman Place, Regester and Oliver streets....	4-in. main
02024	Fairmount avenue, between Chesapeake and Patuxent streets.....	12-in. main
02025	Hoffman street and Harford avenue..... Hoffman street and alley east of Central ave...	4-in. connection
02026	York street, east from Light street.....	Fountain
02028	Central ave., bet. Bank and Aliceanna sts..... Hammond alley, bet. Exeter st. and Central ave.	10-in. and 6-in. main
02029	Calverton road and Harlem avenue.....	5-in. plug
02031	Commerce st., bet. Pratt st. and Exchange place	6-in. main
02032	Madeira st., bet. Oliver and Federal sts..... Federal st., bet. Madeira st. and Patterson Park avenue.....	6-in. main
02033	Mosher street, bet. Mount street and alley east of Vincent alley	6-in. main
02034	Twentieth st., bet. Oak Hill and Garrett aves..	6-in. main
02035	Bolton ave., bet. Ducatel and Whitelock sts...	6-in. main
02036	Eighth st and alley south of Northwest st.....	2-in. blow
02037	Mount st., bet. Mosher st. and Riggs ave.....	6-in. main
02039	Quarry ave., north from Morling avenue... ..	2-in. blow
02040	McHenry st., bet. Scott and Barre sts..... Fremont and Portland street.....	10-in. main 6-in. main

Blue Print Number.	Location.	Size in Inches.
02041	Hammond alley, between President and Albemarle streets	3-in. main
02042	Jefferson st., bet. Rose and Luzerne sts.	6-in. main
02043	Lanvale st., bet. Gilmor and Stricker sts.	6-in. main
02044	Frederick st., bet. Baltimore and Second sts.	6-in. main
02045	Second st., bet. Frederick and South sts. Water st., bet. South and Calvert sts.	6-in. main
02046	Lamont ave., bet. Federal and Lanvale sts. Federal st., at alley east of Aisquith st.	6-in. main
02047	Cathedral st., bet. North alley and Saratoga st.	10-in. and 6-in. main.
02048	Charles st., bet. Pleasant and Lexington sts.	10-in. main
02049	Park avenue and Mulberry street Park avenue and Saratoga street	10-in. connection
02050	Patuxent st., bet Elliott and O'Donnell sts.	6-in. main
02051	Cromwell street, between Twenty-first and Twenty-second streets. Twenty-second street, between Old York road and Cromwell street.	6-in. main
02052	Montebello avenue, between Turner's lane and Exeter Hall avenue	6-in. main
02053	Southwest corner Fairmount ave. and Wolfe st.	Fountain
02054	Southwest corner North ave. and Ensor st.	Fountain
02055	Southeast corner Eastern ave. and Exeter st.	Fountain
02056	Landsdown st., bet. Payson and Monroe sts.	6-in. main
02057	Carroll ave., east of Old York road	2-in. blow
02059	Bradford st., bet. Federal and Lanvale sts.	6-in. main
02060	Sharp and Hanover streets, between Pratt and Lombard streets. Pratt street, bet. Sharp and Hanover streets.	10-in. connection
02061	Madison st., bet. Hargrove alley and Davis st. Davis st., bet. Madison and Centre sts.	30-in. connection
02062	Charles st., bet. Mulberry and Franklin sts.	10-in. and 6-in. connection
02063	Malster ave., bet. Mosher and McMechen sts.	4-in. main
02068	Union st., bet. Druid Hill and Penna. aves.	10-in. connection
02073	Orleans street, between Patterson Park avenue and Milton avenue.	10-in. and 6-in. connection
02074	Northeast corner Cross and Hanover streets.	Fountain
02075	Southwest cor. Monument st. and Loneys lane.	Fountain
02079	Alley west from Jackson street, south from Little Clement street	3-inch main

Blue Print Number.	Location.	Size in Inches.
02081	Louisiana ave., between Pearl and Paca sts...	6-inch main
02082	St. Mary and Madison streets, between McCulloh street and Linden avenue.....	Connection
02084	Wolfe st,, between North ave. and Lanvale st..	6-inch main
02085	Greenmount avenue, north of North avenue...	Fountain
02086	Hoffman and Gay streets.....	Fountain
02087	French lane and alley east of Charles street...	6-inch main
02089	Barney st., between Charles and Olive sts	6-inch main
02094	Bond street, between Fairmount avenue and Fayette street	20-inch connection
02095	Pimlico road, north from Reisterstown road...	6-inch main
02096	Liberty road, between Oakfield avenue and New Liberty road.....	12-inch main
02097	Little Pleasant street, between Cathedral and Charles streets.....	6-inch main
02098	Donaldson st., bet. Charles and Leadenhall st .	6-inch main
02099	Myrtle ave., bet. Lanvale st. and Lafayette ave.	6-inch main
02100	Penn street, between Portland and Pratt streets / Dover st., between Fremont and Penn sts	6-inch main
02103	Stockholm., bet. Howard street and Peach alley	6-in. main
02104	Castle st., bet. McElderry and Jefferson streets.	6 and 4-in. main
02107	Belair road, north from Sinclair lane	10-in. connection
02108	Russell street, Claret alley and Warner street, between Cross and West streets.....	6-in. main
02109	Charles, Hanover, Randall and Olive streets...	20-in. connection
02111	Park ave., bet. Centre street and Teackle alley.	6-in. main
02112	Gould street, bet. Jackson and Covington sts...	6-in. main
02113	Second ave., bet. Chestnut and Roland avenues	6-in. main
02117	Plum alley, between Cross and West streets....	6-in. main
02118	York and Hill, Howard and Sharp streets, between Lee and Hill streets.....	6-in. main
02123	Bonner avenue, between New Liberty road and Winfield avenue.....	6-in. main
02124	Aiken street, bet. North and Lafayette avenues.	6-in. main
02127	Fremont street, bet. Warner and Wayne streets	10-in. connection
02128	Maryland avenue and Chase street.....	6-in. connection
02131	Eager and Charles streets.....	6-in. connection
02142	Gilmore lane, between 29th and 30th streets...	2-in. main
02143	N. w. to n. e. corner Howard and Fayette sts..	Change site of 5-in. plug.
02144	Philadelphia road, between Canton street and Loney's lane.....	Fountain

Blue Print Number.	Location.	Size in Inches.
02152	Light and Randall streets	Connection
02154	Pratt st., bet. Howard and Sharp streets	10-in. main
02156	Hamburg st., bet. Howard and Leadenhall sts.	12-in. connection
02157	Johnson st., Warren ave. and Riverside ave...	10-in. connection
02158	Light street, bet. Henrietta and Hamburg ave.	10-in. main
02159	Sterling street, Ashland avenue to Eager street.	6-in. main
02160	Jefferson street, bet. Ann and Wolfe streets....	6-in. main
02161	Winder street, bet Light and Johnson streets..	10-in. connection
02163	Johnson st., bet. Winder and Donaldson streets	10-in. connection
02164	Ostend st., between Ridgely and Eutaw streets	10-in. connection
02165	Cross st., bet. Sharp st. and alley e. of Race st..	10-in. connection
02166	Eutaw st., between West and Stockholm sts...	4-in. main
02167	Cross st., China alley to Eutaw street	10-in. connection
02168	West street, between Charles and Light streets.	10-in. connection
02169	Hamburg st., bet. Charles and William streets.	12-in. connection
02170	West street, between Sharp and Race streets...	20-in. connection
02171	S. e. corner Bond st. and North avenue	12-in. connection
02172	N. w. corner Rayner avenue and Albert street.	5-in. plug
02173	S. W. corner St. Paul street and Dark lane....	Fountain
02174	Ashland ave., bet. Harford ave. and Ensor st..	6-in. main
02175	Warren avenue and William street	20-in. connection
02176	West st., bet. Riverside ave. and Light street..	10-in. connection
02177	William st., bet. Hamburg and Randall streets	20-in. connection
02178	Clement st., bet. William and Henry streets...	12-in. connection
02180	Hall and Durst alleys, between Clement and Randall streets	6-in. connection
02181	Battery avenue, bet. West and Clement streets.	6-in. connection
02183	Cross street and Covington street	10-in. connection
02185	Hamburg st., from Creek alley to Charles street	12-in. connection
02186	Cross street and Hall alley	6-in. connection
02187	Battery and Riverside avenues, between Hamburg street and Warren avenue	12 and 6-in. connection.
02189	Covington st., bet. Meyers and Clement streets.	6-in. connection
02190	Jackson st., bet. Fort ave. and Clement street. Clement street, bet. Jackson and Webster sts.	10-in. connection
02191	West street, from Race street to Charles street.	20-in. connection
02192	Jackson st., between Fifth lane and Belt street.	10-in. connection
02194	Jefferson street, bet. Taylor and Tyler streets..	6-in. main
02196	Alley s. of Dolphin st. east from Etting street, between Dolphin and Hoffman streets	3-in. main

Blue Print Number.	Location.	Size in Inches.
02197	Bayard st., bet. Ridgeley and Warner streets.. / Russell st., bet. Bush and Bayard streets....	10-in. connection
02199	Carey st., bet. Russell and Warner streets.....	10-in. connection
02201	Boston st., bet. Windsor and Montford avenues	10-in. connection
02202	Clifton ave., bet. Fulton ave. and Monroe st..	6-in. main
02203	Northwest corner Holliday and Water streets..	8-in. D. N. plug
02204	Eastern avenue, between Washington street and Patterson Park avenue.....	20-in. connection
02205	Chester st., between Pratt and Gough streets..	10-in. connection
02217	North ave., bet. Aisquith st. and Kennedy ave.	6-in. main
02218	Twentieth street, between Kennedy avenue and Aisquith street.....	6-in. main
02219	Andre st., between Beason and Marriott street.	6-in. main
02222	Fulton and Lafayette avenues	20-in. connection
02223	Gough st., bet. Chester st. and Collington ave.	10-in. connection
02224	Montford ave., bet. Canton and Foster avenues	20-in. connection
02225	Hudson st., bet. Luzerne and Chesapeake sts..	20-in. connection
02226	Luzerne st., bet. Foster ave. and Hudson st...	20-in. connection
02227	Southeast to northwest corner Patapsco and O'Donnell streets.....	Transfer of 5-in. plug.
	Southwest to northwest corner Chesapeake and O'Donnell streets	Transfer of 5-in. plug.
02228	Moyer street, east from Chester street.....	6-in. main
02229	Hudson st., bet. Patuxent and East ave.....	20-in. connection
02230	Potomac st., bet. Dillon and O'Donnell sts..... / Dillon street, bet. Potomac and Hare streets....	10-in. connection
02231	Collington ave., bet. Preston and Mura sts.....	6-in. main
02244	Southeast corner Baltimore and Frederick sts..	8-in. D. N. plug
02245	Northwest corner Calvert and Lombard sts....	8-in. D. N. plug
02246	Northwest corner Light and Lombard streets...	8-in. D. N. plug
02248	Boston st., bet. Patapsco and Robinson sts.....	10-in. connection
02251	Monument street, between St. Paul street and Hargrove alley.....	6-in. main
02260	Eager st., bet. Collington ave. and Madeira st..	3-in. main
02263	Southeast corner Howard st. and Garrett alley.	8-in. D. N. plug

ABANDONED MAINS AND CHANGED SERVICES.

LOCATION.	Size of Main Abandoned.	Size of Main Connec'd to.	Length in Feet.
Alley n. of Eager st, bet. Broadway and Bond st..	1½ in	3 in	150
Charles st., between Lexington and Saratoga sts ..	1½ in	10 in	425
Dover street, bet. Penn and Fremont streets.....	1½ in	6 in	375
Belair road east from Sinclair lane..... ...	1½ in	10 in	200
Commerce street, between Lombard and Pratt sts.	2 in	6 in	350
Cheapside, between Lombard and Water streets...	2 in	6 in	175
Calvert st., between Lombard and Water streets. .	2 in	6 in	175
Mercer street, between Light and Calvert streets..	2 in	8 in	315
Grant street, between Pratt and Balderston streets.	2 in	6 in	75
South street, between Lombard and Pratt streets..	2 in	6 in	185
Welcome alley, bet. Hanover and Charles streets..	2 in	4 in	150
Hammond alley, bet. Central ave. and Exeter st..	2 in	6 in	325
Mulberry st., bet. Charles street and Park avenue.	2 in	8 in	375
Baltimore street, between Calvert and Grant sts..	2 in	10 in	125
Lorman alley, bet. Arlington and Carrollton aves.	2 in	4 in	250
Bond st., bet. Fairmount ave. and Fayette street..	2 in	20 in	320
Penn street, between Portland and Pratt streets..	2 in	6 in	375
Sharp street, bet. York and Little Hughes streets..	2 in	6 in	425
Hill street, between Sharp and Howard streets...	2 in	6 in	200
Durst alley, between Clement and Randall streets.	2 in	6 in	775
Hall alley, between Clement and Randall streets.	2 in	6 in	625
Fort ave., between Durst alley and Battery ave...	2 in	6 in	125
Maryland avenue, north of Chase street.....	2 in	6 in	150
Madison street, west of Buren street.	2 in	30 in	150
Eager street, east of Charles street.....	2 in	6 in	150
Eastern ave., bet Chester street and Duncan alley.	2 in	20 in	125
Holliday st., bet. Baltimore and Water sts.....	3 in	6 in	375
Hollingsworth st., bet. Pratt and Lombard sts	3 in	6 in	435
Grant street, between Pratt and Lombard streets..	3 in	6 in	300
Graves st., bet. Monument and Madison sts	3 in	6 in	325
Ensor street, between Preston and Oliver streets..	3 in	6 in	750
Oliver st., bet. Greenmount and Guilford aves....	3 in	6 in	300
Light street, between Hughes and Lee streets.....	3 in	10 in	625
Charles street, between Hill and Barre streets....	3 in	6 in	875
York street, between Light and Johnson streets...	3 in	6 in	750
Johnson st., bet. Hughes st. and Armstead lane...	3 in	6 in	150
Armstead lane, bet. William and Johnson sts.....	3 in	6 in	375
O'Donnell's Wharf, bet. Pratt and Wood streets..	3 in	10 in	625
Church lane, bet. St. Paul and Courtland streets..	3 in	6 in	175
St. Paul st., between Fayette and Saratoga streets.	3 in	12 in	700

ABANDONED MAINS AND CHANGED SERVICES.

LOCATION.	Size of Main Abandoned.	Size of Main Connec'd to.	Length in Feet.
Light street, between Lee and Pratt streets.....	3 in	10 in	1,625
Rear s. s. Barre st., bet. Warner and Fremont sts.	3 in	6 in	225
Conway st., between Light and Hanover streets ..	3 in	8 in	750
Charles street, between Barre and Camden streets.	3 in	8 in	750
Rear n. s. Fayette street, west of Gilmor street....	3 in	6 in	175
Ramsay street, between Scott and Parkin streets.	3 in	6 in	375
Rear e. s. Parkin st., bet. Pratt and Ramsay sts...	3 in	6 in	375
E. s. Broadway, bet. Oliver st. and Hoffman place.	3 in	6 in	375
W.s.Central ave. bet. Bank st. and Hammond alley	3 in	10 in	250
Charles street, between Camden and Pratt streets.	3 in	8 in	450
Camden street, between Light and Hanover sts...	3 in	10 in	750
Pratt street, between Light and Charles streets....	3 in	10 in	375
Calhoun alley, between Pratt and Camden streets.	3 in	6 in	450
Water street, between South and Calvert streets ..	3 in	6 in	325
Pratt street, between Hanover and Charles streets.	3 in	10 in	375
Hanover street, between Pratt and Lombard sts..	3 in	12 in	435
Davis street, between Center and Madison streets.	3 in	16 in	750
Madison street, between St. Paul and Davis streets	3 in	30 in	500
Barnett street, between Charles and Liberty streets	3 in	6 in	375
French lane, between Charles and Light streets...	3 in	6 in	200
Rear e. s. Charles st., bet. French lane and Wine al.	3 in	6 in	385
Light street, between Pratt and Balderston streets.	3 in	6 in	250
Union street, bet. Druid Hill and Penna. avenues.	3 in	10 in	800
Little Pleasant st., bet. Charles and Cathedral sts.	3 in	6 in	375
Carrollton ave., bet. Saratoga and Lexington sts..	3 in	6 in	250
Stockholm st., bet. Leadenhall and Sharp streets.	3 in	6 in	400
Claret alley, bet. Cross and West streets.....	3 in	6 in	200
Leadenhall st., between Fort ave. and Wells st...	3 in	6 in	1,500
Plum alley, between Cross and West streets.....	3 in	6 in	375
Light street, bet. Hamburg and Henrietta streets..	3 in	10 in	375
Cross street, between Howard and Plum alley	3 in	10 in	285
Howard street, bet. Cross and Henrietta streets ...	3 in	10 in	625
York street, between Howard and Sharp streets...	3 in	6 in	375
Lee street, between Howard and Sharp streets	3 in	6 in	375
Howard street, between Lee and Hill streets.....	3 in	10 in	175
Preston street, bet. Park ave. and Jenkins alley ..	3 in	6 in	150
Fremont street, bet. Warner and Wayne streets ..	3 in	10 in	675
Ashland ave., bet. Harford ave. and Ensor st.....	3 in	6 in	250
Hamburg street, bet. Charles and William streets.	3 in	12 in	1,000
Howard street, between Cross and West streets...	3 in	10 in	375

ABANDONED MAINS AND CHANGED SERVICES.

LOCATION.	Size of Main Abandoned.	Size of Main Connec'd to.	Length of Feet.
West st., bet. Light st. and Riverside ave.	3 in	10 in	875
William st., bet. Hamburg st. and Randall st.....	3 in	20 in	900
Johnson st., bet. Hamburg st. and Warren ave...	3 in	6 in	375
Riverside ave., bet. Hamburg st. and Warren ave.	3 in	6 in	375
Battery ave., bet. Hamburg st. and Warren ave...	3 in	6 in	375
Hamburg street, Hanover street and Creek alley..	3 in	12 in	300
Exeter street, bet. Eastern and Canton avenues...	3 in	6 in	150
West street, between Charles and Race streets.....	3 in	20 in	750
Rear w. s. Aisquith st., bet. North ave and 20th st.	3 in	6 in	300
Madison st., bet. St. Paul st. and Hargrove alley..	3 in	30 in	150
Chesapeake st., bet. Hudson st. and Fait ave.....	3 in	6 in	250
Foster avenue, bet. Luzerne and Rose streets.....	3 in	20 in	250
Gough street, bet. Chester street and Collington ave.	3 in	10 in	250
Eastern avenue, between Patterson Park avenue and Washington streets.....	3 in	20 in	500
Belvidere street, south of Oliver street.....	4 in	12 in	500
Greenmount ave., bet. Biddle and Oliver sts.....	4 in	12 in	1,175
Biddle st., bet. Clifton Place and Homewood ave..	4 in	20 in	635
Federal st., bet. Ensor st. and Lamont ave.....	4 in	10 in	500
Lee street, between Light and Hanover streets....	4 in	8 in	875
Hanover street, between Hill and Barre streets....	4 in	12 in	875
Hill street, between Light and Hanover streets....	4 in	10 in	875
McHenry street, bet. Fremont and Barre streets...	4 in	20 in	250
McHenry street, bet. Barre and Scott streets.....	4 in	10 in	375
Orleans st., bet. Patterson Park ave and Port st...	4 in	10 in	500
Montford ave., bet. Orleans and Jefferson sts.....	4 in	6 in	175
Fayette street, bet. St. Paul and Charles streets...	4 in	6 in	100
Madison street, Linden ave. and St. Mary street...	4 in	20 in	200
St. Mary st., bet. Madison and Druid Hill aves....	4 in	20 in	300
Charles street, bet. Randall and Winder streets...	4 in	10 in	1,250
Heath street, bet. Charles and Hanover streets....	4 in	6 in	300
Hanover street, bet. Randall and Heath streets...	4 in	6 in	375
Randall st., bet. Light st. and Clarkson alley.....	4 in	20 in	1,250
Russell street, bet. Cross and West streets.....	4 in	6 in	110
Cross street, bet. Russell street and Claret alley...	4 in	6 in	310
Winder street, bet. Charles and Johnson streets...	4 in	10 in	900
Johnson st., bet. Winder and Donaldson sts.....	4 in	10 in	750
Gould street, bet. Johnson and Covington streets..	4 in	6 in	875
Eutaw street, bet. Cross and Hamburg streets.....	4 in	20 in	375
Cross street, bet. Ohio avenue and China alley....	4 in	6 in	250
Hamburg st., bet. Leadenhall and Howard sts....	4 in	12 in	750
Warren avenue, bet. Light and Johnson streets...	4 in	10 in	1,400

LOCATION.	Size of Main Abandoned.	Size of Main Connec'd to.	Length of Feet.
William st., bet. Hamburg st. and Warren ave....	4 in	20 in	375
Hamburg street, bet. Hanover and Charles streets.	4 in	12 in	375
Battery avenue, bet. West and Clement streets ...	4 in	10 in	525
Clement street, bet. William and Henry streets...	4 in	12 in	750
West street, bet. Light and Charles streets.....	4 in	10 in	625
Hanover st., bet. Cross st. and Ropewalk alley....	4 in	20 in	500
Covington st., bet. Wehage and Clement sts.....	4 in	12 in	150
Covington street, bet. Meyers and Clement streets.	4 in	20 in	410
West street, bet. Race and Sharp streets.....	4 in	20 in	800
Jackson street, bet. Cross st. and Fort avenue.....	4 in	10 in	1,875
Clement street, bet. Jackson and Webster streets..	4 in	6 in	750
Cross street, bet. Sharp and Race streets.....	4 in	10 in	800
Baltimore street, east of Hanover street.....	4 in	10 in	150
Lafayette ave., bet. Fulton ave and Bruce st... .	4 in	20 in	150
Bayard street, bet. Ridgely and Warren streets...	4 in	10 in	875
Carey street, bet. Russell and Warner streets.....	4 in	10 in	425
Ostend street, bet. Ridgely and Eutaw streets. ...	4 in	10 in	1,125
Potomac street, bet. O'Donnell and Dillon streets.	4 in	10 in	300
Dillon street, bet. Potomac and Hare streets.....	4 in	12 in	250
Hudson st., bet. Patuxent st. and East avenue....	4 in	20 in	1,125
Russell street, between Bayard and Bush streets..	4 in	10 in	500
Boston street, bet. Patapsco street and East ave...	4 in	10 in	1,625
Luzerne street, between Fait and Foster avenues..	4 in	20 in	400
Montford avenue, bet Canton and Foster avenues.	4 in	20 in	500
Foster avenue, between Montford ave. and Port st.	4 in	20 in	200
Chester street, between Pratt and Gough streets...	4 in	10 in	625
Boston street, bet. Montford ave. and Windsor st.	4 in	10 in	1,125
Eastern avenue, between Patterson Park avenue and Chester street.....	4 in	20 in	150
William street, bet. Hamburg and Randall streets.	4 in	20 in	1,450
Frederick st., bet. Baltimore and Lombard streets.	4½ in	6 in	375
Water st., between Frederick and South streets...	4½ in	6 in	750
Hanover street, between Barre and Pratt streets..	4½ in	12 in	1,200
Pratt street, between Hanover and Sharp streets..	4½ in	10 in	425
Sharp street, between Pratt and Lombard streets.	4½ in	10 in	435
Charles street, bet. Saratoga and Pleasant streets..	4½ in	10 in	400
Saratoga street, bet. Charles st. and Mitchell alley.	4½ in	20 in	125
West side Calvert street, north of Center street...	4½ in	20 in	125
St. Paul street, bet. Fayette and Lexington streets	4½ in	12 in	250
Pratt street, between Sharp and Howard streets...	6 in	10 in	375
Eutaw street, between Cross and Ostend streets..	6 in	10 in	885

TOTAL NUMBER OF FEET OF ABANDONED MAINS.

Size.	Feet.
1½-in. main	1,150
2-in. main	5,920
3-in. main	31,640
4-in. main	35,140
4½-in. main	4,085
6-in. main	1,260
Total	79,195

Equal to $14\frac{5275}{5280}$ miles.

SERVICE CHANGED FROM ABANDONED MAINS.

⅝-in.	771
¾-in.	982
1-in.	46
1½-in	21
2-in.	150
Total	1,970

NEW PLUGS—NEW SITES.

Location.	Size in Inches.	Remarks.
Northeast corner Biddle st. and Homewood ave	5 in	
Southwest corner Light and Lee streets	5 in	
Southwest corner Light and Barre streets	5 in	
Northeast corner Howard and Fayette streets	5 in	
Northwest corner Chesapeake and O'Donnell streets	5 in	
Southeast corner York and William streets	5 in	
Southwest corner Light and Pratt streets	5 in	
Southwest corner Jackson and Heath streets	5 in	
Northwest corner Donaldson and Hanover streets	5 in	
Southwest corner O'Donnell and Patuxent streets	5 in	
Northwest corner Garrett ave. and Twentieth street	5 in	
Northwest corner Rayner avenue and Albert street	5 in	
Southwest corner Park avenue and Whitelock street	5 in	
Northwest corner Harlem avenue and Calverton road	5 in	
Southwest corner Oakfield avenue and Liberty road	5 in	
Southeast corner Central and Eastern avenues	5 in	
Northwest corner Whitelock st. and Mt. Royal Terrace	5 in	
Northeast corner Donaldson and Leadenhall streets	5 in	
Northwest corner Baltimore and Canton streets	5 in	
Northwest corner Baltimore and Potomac streets	5 in	
Northwest corner Baltimore st. and eastern city limits	5 in	
West side Hickory avenue, opposite Roland avenue	5 in	
North side North avenue, opposite Hopkins avenue	5 in	
South end of Belvidere street	5 in	
Foot of Gould street	5 in	
Old Frederick road and Fairview avenue	5 in	Catonsville Water Supply Company.
" " " Kossuth avenue	5 in	
" " " Culver avenue	5 in	
" " " Loudon avenue	5 in	
" " " Irving avenue	5 in	
" " " south of Morley avenue	5 in	
Total	31	

NEW PLUGS—OLD SITE.

Location.	Size in inches.	Remarks.
Northeast corner O'Donnell and Third streets	4 in	
Northwest corner Jefferson and Eden streets	4 in	
Northwest corner Eden and Mullikin streets	4 in	
Northeast corner Greenwillow street and Argyle ave	4 in	
Southwest corner Lombard and Patterson Park ave	4 in	
Southwest corner Payson street and Harlem avenue	4 in	
Northwest corner Preston street and Morris alley	4 in	
Northeast corner Dolphin street and Wilmer alley	4 in	
Northwest corner Fayette and Stockton streets	5 in	
Southwest corner Courtland and Mulberry streets	5 in	
Northeast corner Charles and Madison streets	5 in	
Southwest corner Liberty and Saratoga streets	5 in	
Southeast corner Fayette and Wolfe streets	5 in	
Southeast corner Calhoun and Booth streets	5 in	
Southeast corner Albemarle and Plowman streets	5 in	
Northwest corner Hanover and Hill streets	5 in	
Northwest corner Ramsay and Calhoun streets	5 in	
Northeast corner Lombard and Paca streets	5 in	
Northwest corner Pratt and Sharp streets	5 in	
Northwest corner Exeter and Granby streets	5 in	
Southwest corner Washington and Chase streets	5 in	
Northwest corner Aisquith and Orleans streets	5 in	
Northeast corner Caroline and Bank streets	5 in	
Northwest corner Cross and Sharp streets	5 in	
Northwest corner Howard and Franklin streets	5 in	
Northeast corner Waesche and Fremont streets	5 in	
Southwest corner Fremont street and Myrtle avenue	5 in	
Northeast corner Charles street and Lafayette avenue	5 in	
Northwest corner Biddle street and Greenmount ave	5 in	
Northeast corner Falls road and Union avenue	5 in	
Southwest corner Hoffman street and Jordan alley	5 in	
Southwest corner Charles street and North alley	5 in	
West side Cathedral street, north of Monument street	5 in	
West side Light street, south of York street	5 in	
North side Lanvale street, west of Myrtle avenue	5 in	
North side Saratoga street, east of Carey street	5 in	
North side Hoffman street, east of Wirt street	5 in	
East side Greenmount avenue, south of Oliver street	5 in	
2800 block, Philadelphia road	5 in	
Northeast corner Hill and Charles streets	6 in	Ludlow
Northwest corner Holliday and Water streets	8 in	Double Nozzle Fire Hydrants.
Northwest corner Lombard and Light streets	8 in	
Northwest corner Lombard and Calvert streets	8 in	
Northeast corner Saratoga and Holliday streets	8 in	
Southeast corner Baltimore and Frederick streets	8 in	
Southeast corner Howard street and Garrett alley	8 in	
Total	46	

SPECIAL WORK DONE BY THE CONSTRUCTION DIVISION.

Bursted main.	Henrietta and Howard street. Cut out and replaced 30-in. ¼ bend into 30-in. x 30-in. branch running under city sewer 13 feet deep. The 30-in. bend had blown out of branch, due to settlement, and was replaced and strapped with iron bands and braced with brick piers. Leak reported October 18, 1902; repaired and water turned on October 23, 1902.
Bursted main.	Mt. Royal Pumping Station vault. Cut out bursted 36-in. x 30-in. flange branch and inserted new 36-in. x 30-in. flange branch.
Bursted main.	Hoffman and Ensor streets. Broken 3-in. main in two places over tunnel. The street had caved in for a space of 30 ft. x 25 ft. This leak was telephoned to the Old City Hall, December 25, 1902, at 4.15 P. M. A foreman was sent out at once and main turned off at 4.40 P. M., taking three valves to shut off same.
New style 8-in. Double Nozzle Fire Hydrants.	Northeast corner Holliday and Saratoga streets, on 12-in. middle service main. Northwest corner Holliday and Water streets, on 12-in. middle service main. Southeast corner Howard street and Garrett alley, on 10-in. middle service main. Northwest corner Lombard and Light streets, on 12-in. low service main. Northwest corner Lombard and Calvert streets, on 12-in. low service main. Southeast corner Baltimore and Frederick streets, on 10-in. low service main. There was a test made with two engines, No. 4 and No. 6, at the 8-in. plug northeast corner Holliday and Saratoga streets, and the double line of hose could not lower supply on plug.

Fire hydrants. Old Frederick road, between New Frederick road and Augusta avenue.

Erected six new 5-in. department plugs on the Catons-Water Supply.

Frozen services. All services found shallow, and not being able to lower on account of rock, have been incased in plaster paris to prevent freezing.

Meters. Commencing June 5th, 1902, all new water meters inserted inside of city limits are put in at expense of city, the meter being the property of the city. In place of using wooden boxes a brick vault is built around each meter on the outside with iron box cover.

Electrolysis. There have been twenty cases in 1902, twelve services and eight mains destroyed by Electrolysis, which have been repaired at the expense of the Water Department.

Abandoned mains. There has been a general overhauling of water mains in South Baltimore and East Baltimore, abandoning fifteen miles of small mains from 1½ inches to 6 inches, and changing 1970 services from abandoned mains to larger mains, placing eel guards on all services. There has been a big improvement in shutting off the water in South and East Baltimore, and the mains and valves are so located that any one can shut off the water.

Turn offs. There was a saving of 40 per cent. of turn offs, due to the Construction Division serving 10 days' notice.

Total amount of paving done by this Department during the year 1902:

873,087 feet, cost	$26,282 83
Cost per square yard	$.27\frac{09}{100}$
Cost per square foot	$.03\frac{01}{100}$

BROKEN MAINS REPAIRED.

Size.	Number.
1½-in. mains	2
2-in. mains	5
3-in. mains	41
4-in. mains	39
4½-in. mains	2
6-in. mains	19
10-in. mains	2
12-in. mains	2
20-in. mains	1
30-in. mains	1

JOINT LEAKS CAULKED.

1½-in. joint	212
2-in. joint	65
3-in. joint	146
4 in. joint	272
4½-in. joint	32
6-in. joint	248
8-in. joint	17
10-in. joint	150
12-in. joint	49
16-in. joint	27
18-in. joint	1
20-in. joint	58
30-in. joint	23
36-in. joint	40
40-in. joint	4
48-in. joint	1

CRIPPLED STOPS LOCATED.

1-in. stops	1
2-in. stops	3
3-in. stops	8
4-in. stops	10
6-in. stops	3
10-in. stops	2

VALVES USED.

½-in. valves	277
⅝-in. valves	1,233
¾-in. valves	1,395
1-in. valves	208
1½-in. valves	31
2-in. valves	132
3-in. valves	135
4-in. valves	172
6-in. valves	229
8-in. valves	10
10-in. valves	23
12-in. valves	5
20-in. valves	2

NEW VALVES PLACED.

New Sites.

2-in. valves	6
3-in. valves	3
4-in. valves	6
6-in. valves	5
10-in. valves	2
20-in. valves	2

Old Sites.

2-in. valves	3
3-in. valves	15
4-in. valves	12
6-in. valves	2
10-in. valves	1
12-in. valves	1

NEW BLOW-VALVES.

New Sites.

1-in. blow-valves	3
2-in. blow-valves	9
3-in. blow-valves	1

Old Sites.

1-in. blow-valves	1
2-in. blow-valves	5
3-in. blow-valves	3

SUPPLIES BILLED.

¾-in supplies	18
1-in supplies	69
1½-in supplies	11
2-in supplies	10
3-in supplies	2
4-in supplies	4
6-in supplies	7
8-in supplies	1
10-in supplies	1
12-in supplies	1

NEW SERVICE CONNECTIONS.

$12.00 supplies	1,217
8.00 supplies	58
6.00 supplies	137

NEW CONNECTION, OLD SUPPLY.

$6.00 new service connections, old supply	639

NEW FOUNTAINS.

New Sites.

Southwest corner North avenue and Ensor street.
Southeast corner Eastern avenue and Exeter street.
Southwest corner Fairmount avenue and Wolfe street.
Southwest corner Monument street and Loneys lane.
Northeast corner Hanover and Cross streets.
Opposite 1900 Greenmount avenue.
Northeast corner Hoffman and Gay streets.
Opposite 3127 Philadelphia road.
Southwest corner St. Paul street and Church lane.
South side York street, between Light and William streets.

Old Site.

Northeast corner Park avenue and Preston street.

ABANDONED FOUNTAINS.

Southwest corner Saratoga and Pearl streets.
Northwest corner Covington and Randall streets.
Southeast corner Gough and Bethel streets.
Northwest corner Canton avenue and Port street.
South side Baltimore street, opposite Rose street.

Fountains repaired	223
Fountains turned off	265
Fountains cleaned and regulated	2,135
Fountains sent to Mechanical Division for repairs	6
Fountains clogged, relieved	52
Fountains, inspections	161

FORCE OF CONSTRUCTION DIVISION JANUARY 1, 1903.

Superintendent	1
General Foreman	1
Chief Clerk	1
Bookkeeper	1
Record Clerks	2
Office Clerks	2
Emergency Clerks	1
Storekeeper	1
Assistant Storekeeper	1
Foreman of wagon	1
Foreman of paving	1
Night Watchmen	2
Meter Foremen	4
Main Foremen	3
Service Foremen	5
Emergency Foreman	1
Bricklayers	2
Pavers	9
Rammers	9
Caulkers	12
Tappers	8
Turn-off Men	4
Blow-stop men	3
Inspector of Main and Service	1
Laborers	99
Carts	9
Superintendent wagons	1
Department's Wagons	9
Department Emergency Wagon	1
Department Horses	13
Department Harness Sets	11
Department Storm Blankets	13
Department Blankets	13
Department Horse Sandals	5
Department Wagon Drivers	11

CAR FARES USED IN 1902.

January	1,200
February	800
March	900
April	900
May	1,000
June	1,200
July	1,000
August	1,200
September	1,200
October	1,200
November	1,200
December	525
Total	12,325

NEW METERS PLACED.

Make.	Number.	Size in Inches.
Disc meters	5	$\frac{5}{8}$-in
Hersey meters	2	$\frac{5}{8}$-in
Union meters	229	$\frac{3}{4}$-in
Hersey meters	7	$\frac{3}{4}$-in
Empire meters	12	$\frac{3}{4}$-in
Crown meters	3	$\frac{3}{4}$-in
Union meters	45	1-in
Hersey meters	5	1-in
Empire meters	7	1-in
Union meters	10	$1\frac{1}{2}$-in
Hersey meters	7	$1\frac{1}{2}$-in
Union meters	14	2-in
Union meters	9	3-in
Hersey meters	2	3-in
Gem meters	4	3-in
Torrent meters	4	3-in
Union meters	5	4-in
Gem meters	6	4-in
Torrent meters	7	4-in
Gem meters	4	6-in
Total	387	

REPAIRED WATER MAINS AND SERVICES DESTROYED BY ELECTROLYSIS.

Month.	Date.	Location.	Size of Service.	Size of Main.
Feb....	6	Light street, near Randall street.....	.....	4 in
March..	24	825 Light street	¾ in	.....
April...	20	Opposite 1616 Light street.....	.....	4 in
April...	22	1731 Light street	¾ in	.....
April...	25	Pratt and President streets	.....	6 in
April...	28	1620 Light street	.....	4 in
May....	21	725 Iceland street	¾ in	.....
June....	30	1507 Light street.....	¾ in	.....
July....	28	807 East Pratt street.....	¾ in	.....
July....	29	102 Concord street.....	¾ in	.....
Sept. ...	3	204 South Eutaw street.....	¾ in	.....
Sept. ...	18	1232 South Charles street....	¾ in	.....
Sept. ...	27	Light and Randall streets.....	.....	6 in
Sept. ...	29	394 Waverly avenue.....	¾ in	.....
October.	5	1618 Light street.....	.....	4 in
October.	9	405 West Lombard street.....	¾ in	.....
October.	14	Foot of Fort avenue—Fruit Stand.....	¾ in	.....
October.	20	West side Light street, near Heath street.	.....	4 in
October.	21	1705 Light street	¾ in	.....
October.	27	West side Light st., south of Randall st...	.....	4 in

Total number of Fire Hydrants in use December 31, 1902	2,283
Total number of Fountains in use December 31, 1902	226
Total number of Blow-stops in use December 31, 1902	363
Total number of Meters in use December 31, 1902	1,907
Total number of Indicators in use December 31, 1902	275
Total number of Sewer-inlet Blows in use December 31, 1902	202
Service pipes repaired	557
Private pipe leaks turned off	740
New sheet rims placed on old sites	112
Clogged services relieved	129
Number leak calls	477
Fire hydrants capped and repaired	935
Valves packed and repaired	399
Painted plug covers placed	785
Fire hydrants flushed	51,725
Blow-stops flushed	7,746
Fire hydrants pumped out	12,487
Plumbing inspections	137
Ferrules drawn for leaks	179
Abandoned ferrules drawn	131
Meters repaired (no bill)	561
Meter dials placed	79
Meter service repairs (bill)	633
Meters sent to Mechanical Division for repairs	234
Meter inspections	114
Clogged meters relieved	61
Auxiliary meters placed	100
Original meters placed	193
Ferrules drawn order of Water Collector	156
Ferrules returned order of Water Collector	61
Services turned off order of Water Collector	2,693
Services turned on order of Water Collector	2,216
Services frozen and thawed out	133
Services lowered	33
Clogged mains relieved	9
Clogged fire hydrants relieved	8

2 6 x 4 A. P. Smith Clamp and Valve.
2 10 x 3 A. P. Smith Clamp and Valve.
5 10 x 4 A. P. Smith Clamp and Valve.
12 10 x 6 A. P. Smith Clamp and Valve.
7 12 x 6 A. P. Smith Clamp and Valve.
1 16 x 6 A. P. Smith Clamp and Valve.
2 20 x 4 A. P. Smith Clamp and Valve.

5 20 x 6 A. P. Smith Clamp and Valve.	
1 20 x 8 A. P. Smith Clamp and Valve.	
1 20 x 10 A. P. Smith Clamp and Valve.	
1 30 x 4 A. P. Smith Clamp and Valve.	
2 30 x 6 A. P. Smith Clamp and Valve.	
1 30 x 12 A. P. Smith Clamp and Valve.	
$\frac{5}{8}$-in. Eel Guard and Unions	1,787
$\frac{3}{4}$-in. Eel Guard and Unions	1,724
1-in. Eel Guard and Unions	163
$1\frac{1}{2}$-in. Eel Guard and Unions	32
2-in. Eel Guard and Unions	139
Total	3,845

Size.	Class.	Pipe Fittings Used.	Number.
2 in	A	3 way branches	4
3 in	A	3 way branches	13
3 in	B	3 way branches	1
4 in	A	3 way branches	26
$4\frac{1}{2}$ in	A	3 way branches	1
6 in	A	3 way branches	126
8 in	A	3 way branches	3
10 in	A	3 way branches	54
10 in	B	3 way branches	1
12 in	A	3 way branches	10
16 in	B	3 way branches	1
3 in	A	4 way branches	1
4 in	A	4 way branches	2
6 in	A	4 way branches	44
10 in	A	4 way branches	20
12 in	A	4 way branches	7
20 in	A	4 way branches	1
3 in	A	Reducers	76
3 in	B	Reducers	3
4 in	A	Reducers	107
4 in	B	Reducers	3
6 in	A	Reducers	144
8 in	A	Reducers	3
10 in	A	Reducers	14
12 in	A	Reducers	5
16 in	B	Reducers	1
20 in	A	Reducers	1
2 in		Sleeves	39

Size.	Class.	Pipe Fittings Used.	Number
3 in		Sleeves	173
4 in		Sleeves	170
6 in		Sleeves	188
8 in		Sleeves	4
10 in		Sleeves	58
12 in		Sleeves	17
16 in		Sleeves	1
20 in		Sleeves	4
30 in		Sleeves	1
2 in	A	¼ bends	55
3 in	A	¼ bends	13
4 in	A	¼ bends	37
6 in	A	¼ bends	30
10 in	A	¼ bends	2
10 in	B	¼ bends	4
12 in	A	¼ bends	1
2 in	A	⅛ bends	1
3 in	A	⅛ bends	13
3 in	B	⅛ bends	2
4 in	A	⅛ bends	44
4 in	B	⅛ bends	1
6 in	A	⅛ bends	64
10 in	A	⅛ bends	8
12 in	A	⅛ bends	2
2 in	A	1-16 bends	4
3 in	A	1-16 bends	7
4 in	A	1-16 bends	15
6 in	A	1-16 bends	23
8 in	A	1-16 bends	1
2 in		Caps	16
3 in		Caps	72
4 in		Caps	89
6 in		Caps	62
10 in		Caps	4
12 in		Caps	1
2 in		Extension iron boxes	14
3 in		Extension iron boxes	89
4 in		Extension iron boxes	44
6 in		Extension iron boxes	106
8 in		Extension iron boxes	3
10 in		Extension iron boxes	10
12 in		Extension iron boxes	2

Size.		Feet.	Inches.
¾ in	Lead lined pipe used	45,294	6½
1 in	Lead lined pipe used	2,191	10
1½ in	Lead lined pipe used	692	8½
2 in	Lead lined pipe used	402	3
	Total feet	48,581	4

1½ in A	Cast iron pipe	259	5
2 in A	Cast iron pipe	1,832	7½
3 in A	Cast iron pipe	2,873	4½
4 in A	Cast iron pipe	3,793	3½
6 in A	Cast iron pipe	26,361	9
6 in B	Cast iron pipe	9,881	6
8 in A	Cast iron pipe	132	6
10 in A	Cast iron pipe	7,191	10
10 in B	Cast iron pipe	60	..
12 in A	Cast iron pipe	340	10
12 in B	Cast iron pipe	473	..
16 in B	Cast iron pipe	20	..
20 in A	Cast iron pipe	9	..
30 in A	Cast iron pipe	5	7
	Total feet	53,234	8½

LENGTH AND COST OF NEW MAINS LAID IN 1902.

Class.	Diam. Inches.	Length in Feet.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Laying Pipe.	Cost of Paving.	Total Cost.	Average Cost Per Foot.
.....	3	767	$ 231 57	$ 92 75	$ 11 34	$ 335 66	$ 42 24	$ 377 90	$ 49 3/10
.....	4	610	180 82	63 61	7 49	251 92	31 72	283 64	46 5/10
A	6	22,446	11,201 21	2,448 75	395 82	14,045 78	1,272 44	15,318 22	68 2/10
B	6	10,523	6,284 41	1,240 60	217 24	7,742 25	313 95	8,056 20	76 6/10
A	10	6,972	7,045 64	1,156 05	247 49	8,449 18	614 58	9,063 76	1 30
B	12	757 old pipe	674 53	174 70	16 73	865 96	7 45	873 41	1 15 4/10
Totals ..		42,075	$25,618 18	$5,176 46	$ 896 11	$31,690 75	$2,282 38	$33,973 13	.....

MAIN CONNECTIONS IN 1902.

Class.	Diam. Inch.	Length in Feet.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Connections.	Cost of Paving.	Total Cost.
.....	2	1,280	$ 464 96	$ 349 69	$ 34 34	$ 848 99	$ 135 33	$ 984 32
.....	3	1,059	1,117 04	583 77	41 68	1,742 49	193 58	1,936 07
.....	4	2,165	2,466 25	1,250 59	82 04	3,798 88	447 90	4,246 78
.....	6	1,329	3,636 25	1,977 73	141 56	5,755 54	577 36	6,332 90
.....	8	49	151 15	100 10	9 78	261 03	42 41	303 44
.....	10	237	765 47	363 40	30 08	1,158 95	68 49	1,227 44
.....	12	25	90 45	60 08	3 48	154 01	11 61	165 62
.....	20	5	.....	64 08	.....	64 08	.....	64 08
Totals		6,149	$8,691 57	$4,749 44	$342 96	$13,783 97	$1,476 68	$15,260 65

METERED SUPPLIES INSERTED IN 1902 BILLED.

Month.	Meters. Number of Each Size.								Total	Cost of Meters.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Paving.	Total Cost.	Amount Received for Supplies.	Profit.
	⅝-in.	¾-in.	1-in.	1½-in.	2-in.	3-in.	4-in.	6-in.									
January	....	....	2	....	1	1	1	....	5	$ 312 40	$ 122 62	52 15	$ 6 98	$ 6 64	$ 500 79	$ 519 63	$ 18 84
February	....	1	....	1	1	....	....	1	4	457 10	99 44	83 07	10 41	18 41	668 43	689 56	21 13
March	....	2	1	....	1	3	2	....	9	680 31	224 83	93 45	9 19	20 53	1,028 31	1,063 11	34 80
April	....	1	3	....	....	3	....	....	7	324 52	120 46	105 84	15 15	34 98	600 95	628 59	27 64
May	....	....	3	2	....	3	4	....	12	1,041 40	300 30	143 25	20 96	19 69	1,525 60	1,547 22	48 42
June	1	5	....	1	1	1	....	....	9	245 96	151 96	91 23	12 72	17 38	519 25	414 99	27 33
July	....	1	1	3	1	....	....	....	6	218 73	126 03	40 68	8 57	26 13	420 14	236 14	20 14
August	1	2	2	1	....	3	1	....	10	517 27	274 36	119 65	15 54	39 87	966 69	513 11	44 94
September	....	....	....	....	1	....	....	....	1	54 00	26 65	56 98	7 07	33 74	178 44	136 88	12 44
October	2	1	3	2	1	1	1	2	13	1,157 16	403 19	167 51	23 08	55 77	1,806 71	729 51	64 96
November	....	2	....	....	1	....	....	1	4	434 97	123 96	54 34	9 68	4 07	627 02	239 76	19 21
December	1	5	4	1	2	....	2	....	15	625 48	209 27	118 48	21 61	21 43	996 27	407 87	37 08
Totals	5	20	19	11	10	15	11	4	95	$6,069 30	$2,183 07	$1,126 63	$160 96	$298 64	$9,838 60	$7,126 37	$376 93

METERED SUPPLIES INSERTED IN 1902.

Month.	Meters. Number of Each Size.								Cost of Meters.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Paving.	Total Cost.
	⅝-in.	¾-in.	1-in.	1½-in.	2-in.	3-in.	4-in.	Total.						
January														
February							1	1	$ 133 94	$ 13 46	$ 8 00	$ 1 25	$ 1 85	$ 158 50
March			1					1	26 80	1 33	4 50	93		33 56
April														
May		2	1				2	5	400 41	57 63	26 98	4 28	1 47	490 77
June														
July		17	5		2		2	26	560 70	152 78	218 94	34 72	162 08	1,129 22
August		26	6	1	1			34	381 68	185 51	186 56	32 88	171 28	957 91
September		48	11	2	1	1		63	1,007 14	340 47	350 11	45 44	228 14	1,971 30
October		45	7	1		2	2	57	1,203 60	304 92	297 42	50 40	197 73	2,054 07
November	1	21	6	1				29	425 00	189 46	148 44	27 28	118 29	908 47
December	1	71	2	1		1		76	1,174 45	352 81	377 57	62 79	121 36	2,088 98
Total	2	230	39	6	4	4	7	292	$5,313 72	$1,598 37	$1,618 52	$259 97	$1,002 20	$9,792 78

NEW SERVICE CONNECTIONS IN 1902.

Month.	No.	No. of Feet Pipe.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Paving.	Total Cost.	Amount Rec'd for Connect'ns	Net Profit.	Loss.
January	113	1,303	$ 566 80	$ 249 77	$ 32 73	$112 93	$ 962 23	$ 900 00	.....	$ 62 23
February....	45	732	271 68	149 99	19 92	71 17	512 76	326 00	.....	186 76
March.....	163	2,031	830 02	333 12	45 36	188 32	1,396 82	1,504 00	$ 107 18	.....
April.....	195	3,181	1,026 67	375 62	50 39	215 00	1,667 68	2,072 00	404 32	.....
May.....	200	3,027	1,035 74	406 16	57 52	269 83	1,769 25	2,052 00	282 75	.....
June.....	186	3,117	944 73	369 37	55 66	186 71	1,556 47	1,942 00	385 53	.....
July.....	179	2,890	920 67	356 60	56 12	210 00	1,543 39	1,614 00	70 61	.....
August.....	169	2,424	797 18	361 94	60 03	181 30	1,400 45	1,674 00	273 55	.....
September..	248	4,382	1,346 45	524 56	67 90	330 21	2,269 12	2,462 00	192 88	.....
October	218	3,589	1,173 11	438 91	73 06	226 35	1,911 43	2,030 00	118 57	.....
November..	227	3,845	1,184 04	443 22	68 55	269 96	1,965 77	2,102 00	136 23	.....
December...	108	1,664	538 14	234 22	37 96	98 42	908 74	1,046 00	137 26	.....
Totals....	2,051	32,185	$10,635 23	$4,243 48	$625 20	$2,360 20	$17,864 11	$19,724 00	$2,108 88	$248 99

SERVICE CONNECTIONS IN 1902 BILLED SUPPLIES.

Month.	Number of Connections.	Number of Feet Pipe.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Paving.	Total Cost.	Amount Received.	Profit.
January	7	260.2 inches.	$ 159 76	$ 68 83	$ 6 88	$ 23 51	$ 258 98	$ 284 88	$25 90
February	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	7	111.8 inches.	78 82	66 36	8 15	16 97	170 30	187 33	17 03
April	12	154.4 "	278 41	165 51	14 96	30 60	489 48	538 43	48 95
May	16	253.5 "	429 73	124 35	15 64	27 81	597 53	657 28	59 75
June	11	240.1 "	156 60	46 82	7 32	18 58	229 32	252 25	22 93
July	11	140.7 "	150 34	46 43	7 18	17 89	221 84	244 02	22 18
August	17	138.2 "	153 11	97 88	13 73	16 06	280 78	309 49	28 71
September	18	194.3 "	273 68	84 78	12 48	37 18	408 12	448 93	40 81
October	12	83.6 "	104 42	42 95	7 54	19 62	174 53	191 98	17 45
November	9	137.5 "	122 26	38 39	9 43	22 47	192 55	211 81	19 26
December	4	100.9 "	65 52	20 75	2 47	4 62	93 36	102 70	9 34
	124	1,814.4 inches.	$1,972 65	$803 05	$105 78	$235 31	$3,116 79	$3,429 10	$312 31

HYDRANTS, FOUNTAINS AND VALVES INSERTED IN 1902.

Month.	Hydrants.						Fountains.		Valves.										Total. Cost.
	Number and Size.				Total No.	Cost.	Number.	Cost.	Number and Size.								Total No.	Cost.	
	4 in.	5 in.	6 in.	8 in.					1 in.	2 in.	3 in.	4 in.	6 in.	8 in.	10 in.	12 in.	20 in.		
January	....	6	....	....	6	$ 283 10	....	....	....	4	3	5	....	....	....	1	....	13	$ 348 26	$ 631 36
February	1	....	....	...	1	48 26	....	.....	....	....	1	1	....	....	....	....	....	2	28 95	77 21
March	1	9	....	....	10	566 84	....	.....	....	2	2	....	3	....	....	....	....	7	30 26	597 10
April	1	6	1	....	8	468 26	....	.....	....	1	..	....	2	....	....	....	....	3	35 25	503 51
May	1	3	....	....	4	194 02	1	$ 39 26	...	5	5	2	3	....	....	....	...	15	248 86	482 14
June	2	1	....	....	3	166 43	3	58 44	...	2	3	1	1	....	....	....	....	7	132 35	357 22
July	....	....	....	1	1	183 63	4	151 16	....	....	3	3	....	1	2	...	....	9	215 97	550 76
August	1	3	...	...	4	229 49	....	.....	1	1	3	4	6	....	1	....	....	16	344 08	573 57
September	1	8	....	....	9	648 35	1	37 86	....	1	1	2	8	....	....	....	....	12	86 47	772 68
October	....	7	....	....	7	375 38	1	23 93	....	5	....	1	3	....	....	...	....	9	114 58	513 89
November	....	1	...	1	2	118 81	1	10 47	2	1	....	1	1	....	....	....	2	7	490 37	619 65
December	2	1	....	4	7	719 08	....	.....	1	1	1	4	...	4	....	....	....	11	172 09	891 17
Totals	10	45	1	6	62	$4,001 65	11	$321 12	4	23	22	24	27	5	3	1	2	111	$2,247 49	$6,570 26

REPAIRS TO METERS AND SERVICE CONNECTIONS IN 1902.

Months.	Meters. Number of Each Size.									Cost of Repair Meters.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Paving.	Total Cost.
	⅝ In.	¾ In.	1 In.	1½ In.	2 In.	3 In.	4 In.	6 In.	Total.						
January....	4	22	10	8	15	18	4	1	82	$ 420 00	$ 124 44	$ 799 88	$ 65 21	$ 238 87	$1,228 40
February...	....	5	5	2	4	10	....	1	27	284 19	374 86	1,702 96	173 93	406 06	2,657 81
March.....	4	34	20	20	17	33	7	....	135	489 19	157 79	870 20	68 48	336 46	1,432 93
April.....	4	16	17	9	20	30	4	...	100	535 07	188 05	877 34	103 90	510 74	1,680 03
May.....	.. .	8	3	4	9	19	4	....	47	397 01	143 67	860 89	81 20	409 46	1,495 22
June	9	18	29	6	19	39	4	....	124	477 29	139 96	815 94	84 84	254 79	1,295 53
July.....	6	32	23	6	12	42	6	....	127	534 10	146 44	874 20	71 46	358 92	1,451 02
August.....	....	8	12	....	9	18	2	1	50	496 17	181 60	901 69	53 21	546 75	1,683 25
September..	2	42	22	13	12	25	4	....	120	505 59	151 78	811 87	64 37	363 55	1,391 57
October....	7	34	13	9	12	27	3	....	105	748 41	338 40	1,012 83	89 05	380 48	1,820 76
November..	....	47	17	16	9	30	....	....	119	488 09	135 67	742 11	95 21	204 45	1,177 44
December..	2	29	13	11	18	28	....	....	101	690 35	249 31	1,064 65	99 17	285 22	1,698 35
Totals....	38	295	184	104	156	319	38	3	1,137	$6,065 46	$2,331 97	$11,334 56	$1,050 03	$4,295 75	$19,012 31

COST OF REPAIRS TO MAINS IN 1902.

Month.	Number Joint Leaks.	Number Breaks.	Pt. Mains Abandoned.	Mains Lowered and Locations Changed.	Cost of Material.	Cost of Labor.	Cost of Hauling.	Cost of Repairs.	Cost of Paving.	Total Cost.
January ..	74	10	2,710	.....	$188 25	$ 820 29	$ 53 01	$1,061 55	$ 425 73	$1,487 28
February..	19	7	.....	.....	31 01	484 33	41 88	557 22	85 87	643 09
March....	145	6	3,860	.....	294 57	1,019 58	71 50	1,385 65	997 41	2,383 06
April. ...	165	9	8,675	3	230 19	950 79	62 61	1,243 59	1,116 25	2,359 84
May.....	122	4	5,175	1	684 61	1,126 57	67 86	1,879 04	1,042 52	2,921 56
June	47	8	7,295	3	1,228 98	1,945 83	127 17	3,301 98	1,108 05	4,410 03
July.....	71	11	4,705	2	445 02	1,271 32	88 52	1,804 86	1,128 94	2,933 80
August ...	94	5	9,405	3	440 66	1,161 60	74 88	1,677 14	1,137 67	2,814 81
September	99	13	5,525	2	485 20	1,286 20	102 31	1,873 71	1,052 70	2,926 41
October ..	131	19	19,235	2	1,576 34	2,135 67	146 53	3,858 54	1,393 77	5,252 31
November	102	7	5,950	2	1,275 44	1,863 24	110 96	3,249 64	1,138 80	4,388 44
December.	98	17	6,660	3	1,704 54	2,054 71	150 63	3,909 88	1,188 43	5,098 31
Totals ..	1 167	116	79,195	21	$8,584 81	$16,120 13	$1,097 86	$25,802 80	$11,816 14	$37,618 94

REPAIRS TO HYDRANTS, FOUNTAINS AND VALVES 1902.

Month.	Hydrants.						Fountains Cleaned and Repaired.		Valves.	Total Cost of Repairs.
	Number.				Total Number.	Cost of Repairs.	Number.	Cost of Repairs.	Cost of Repairs.	
	4 in.	5 in.	6 in.	8 in.						
January	7	17	....	...	24	$ 264 14	21	$ 40 99	$ 225 64	$ 530 77
February	9	25	2	...	36	317 67	3	22 24	138 57	478 48
March	19	37	....	....	56	527 31	201	145 62	162 95	835 88
April	11	35	....	....	46	330 91	547	308 02	167 70	806 63
May	11	24	1	....	36	314 87	460	163 43	250 95	729 25
June	14	35	....	....	49	267 29	557	202 58	321 53	791 40
July	12	42	1	....	55	302 80	564	170 42	286 51	759 73
August	23	36	....	1	60	427 31	611	156 46	314 38	898 15
September	10	34	.. .	....	44	203 79	319	84 80	267 70	556 29
October	14	42	....	....	56	291 02	381	128 84	239 98	659 84
November	12	42	....	....	54	182 57	336	63 97	257 03	503 57
December	17	35	1	....	53	291 34	332	242 02	268 87	802 23
Totals	159	404	5	1	569	$3,721 02	4,332	$1,729 39	$2,901 81	$8,352 22

COST OF MISCELLANEOUS WORK DONE IN 1902

Month.	Material and Labor.				Paving.						Car Fare.	Total Cost of Work.
	Materials. Cost.	Labor. Cost.	Hauling. Cost.	Total. Cost Material and Labor.	Materials. Cost.	Labor. Cost.	Hauling. Cost.	Total Cost of Paving.	Number Square Feet Paving.	Cost Per Square Foot.		
Jan.....	$ 12 60	$ 2,071 30	$ 232 73	$ 2,316 63	$ 1 80	$ 90 49	$ 26 06	$ 118 35	2,931	.04 4/100	$ 5 15	$ 2,440 13
Feb.....	29 38	1,841 91	184 46	2,055 75	2 46	27 73	10 76	40 95	840	.04 8/100	6 70	2,103 40
March...	96	1,452 52	192 48	1,645 96	2 92	44 07	14 17	61 16	1,636	.03 73/100	4 40	1,711 52
April....	1 54	1,279 73	166 26	1,447 53	1 96	43 64	14 75	60 35	1,455	.04 15/100	6 50	1,514 38
May....	1 65	1,994 62	187 82	2,184 09	2 08	197 49	62 59	262 16	6,835	.03 83/100	16 35	2,462 60
June	38	2,036 73	200 01	2,237 12	3 74	273 48	78 41	355 63	7,945	.04 48/100	16 60	2,609 35
July.....	31	1,762 90	191 23	1,954 44	11	64 32	19 08	83 51	1,974	.04 23/100	8 35	2,046 30
August...	5 33	2,075 76	105 94	2,187 03	35	69 50	20 53	90 38	2,413	.03 74/100	5 45	2,282 86
Sep'mber	96	1,696 62	209 57	1,907 15	96	64 16	15 90	81 02	1,744	.04 64/100	8 70	1,996 87
October..	1 17	1,888 16	214 36	2,103 69	1 66	43 59	9 90	55 15	1,251	.04 41/100	8 60	2,167 44
Novem'r.	18	1,672 44	222 41	1,895 03	4 37	47 30	11 53	63 20	1,076	.05 87/100	5 20	1,963 43
Decem'r..	4 94	2,018 67	246 74	2,270 35	1 74	57 79	22 20	81 73	3,744	.02 18/100	7 25	2,359 33
Totals.	$59 40	$21,791 36	$2,354 01	$24,204 77	$24 15	$1,023 56	$305 88	$1,353 59	33,844	.04	$99 25	$25,657 61

Report of the Mechanical Division.

1902.

BALTIMORE, December 31, 1902.

Mr. A. M. QUICK, *Water Engineer, City Hall.*

DEAR SIR—I beg to submit the following statement of work performed by the Mechanical Division during the year ending December 31, 1902.

This Division has chiefly been engaged with the routine work of making and repairing valves, fire hydrants, water meters, street fountains, and making improvements and repairs to the different pumping stations, and doing miscellaneous work for the other divisions of the Department.

At the Mt. Royal Pumping Station 4,527,730,007.61 gallons of water were pumped to the Western High District at a cost of .0053c. per 1,000 gallons, and 567,121,736.13 gallons were pumped into the middle service at a cost of .0029c. per 1,000 gallons; also 200 carloads of bituminous coal, weighing 15,916,225 pounds, were received and unloaded.

Repairs were made to main pumps, auxiliary pumps, boilers, feed pumps, coal conveyor, dynamos and other machinery. On January 22, at 11.45 a. m., a 36x30 inch Y Branch on the force main in the vault at the station was found cracked and leaking badly, the pumps were stopped, and station put out of service until repairs were made, during which time the high service was supplied by pumping from the Eastern Pumping Station with both pumps, Nos. 839 and 1207, until May 1, when the station was again put in service.

During the time the station was shut down, 33 feet $9\frac{11}{16}$ inches of the 6-inch auxiliary steam line was renewed.

Removed for repairs one of the 10-inch steam mains, $3\frac{1}{2}$ inch and 1-inch drain connections, and 11 gate valves, and nearly all this line was renewed with new flanged sections, the joints and fittings of which were scraped and ground.

During the time the station was out of service, alterations were made to the coal conveyor, on account of the conveyor chain constantly jumping the track, due to its being two and five-eighth inches out of line at the east end, thereby causing much trouble and delay in the handling of coal for the station. To obviate this trouble, and to reduce the friction and wear on the conveyor, it was found necessary to transfer the conveyor driver from the basement to the upper line over the coal bunkers, and two solid curves in the ash bunkers were removed, and two roller curves, furnished by the C. W. Hunt Co., were substituted. Since alterations were made, the conveyor worked much more satisfactorily. Partitions were erected on the gallery around the conveyor driver to protect it from coal dust from the bunkers.

Guard strips were secured to the sides of the crosshead slides for retaining oil in the end pockets, and wire oil collectors were applied to the crossheads to distribute the oil over the surface of the slides to prevent them from scoring. Renewed armature on dynamo No. 1, and applied oil shields over the governor wheels of both dynamos.

The track scale was inspected and tested on September 6th by the Baltimore and Ohio Railroad Company's test car No. X 50, and found to over register. The scale was then adjusted to register correctly.

A small hand drill press was erected in the basement for light drilling purposes.

Sixteen expanded metal lockers and four wash basins and one slop sink were placed in the fireman's lavatory, and the walls and woodwork repainted.

The link motion of Engine No. 1209 was overhauled and 25 new gun-metal bushings were used; also fitted up one bed plate for air compressor.

Repaired brick work in boilers, pointed up joints on building and repaired gutters, catch basins and gutters on roof. Refilled slope and lawn around the station.

Painted water ends of both pumps and touched up painting on engines, also painted all the iron work of the coal bunkers and roof girders over the bunkers.

At the Eastern Pumping Station 3,533,182,571.55 gallons of water were pumped to the Eastern High Service District at a cost of .0059c. per 1,000 gallons, and 2,075,382 gallons were pumped to the Middle Service at a cost of .0045c. per 1,000 gallons; 3,299 cart loads of coal, weighing 9,267,870 pounds, were hauled from the bins to the boiler-room. This station was put out of service on May 1st for one month for the purpose of renewing a number of leaky gaskets on the main steam pipes over the boilers, and repairs were also made to the main pumps, auxiliary pumps, boiler feed pumps, piping and other machinery.

On June 15th, at 6.30 A. M., one side rod on No. 2 side of Engine No. 1207 broke off at the piston fit and bent a horse-power rod and side rod. A new side rod was immediately ordered and repairs were made as soon as it was received.

New boiler feed pump was placed in position in the boiler-room and steam-pipe connection made.

The rain leaks between the tiles of the roof were closed with an elastic roofing cement.

One hundred and fifty car loads of coal, weighing 10,113,200 pounds, were received and unloaded.

At the Western Pumping Station 82,870,128 gallons of water were pumped to the upper service at a cost of .0122c. per 1,000 gallons and 143,393,581 gallons were pumped to the

Western High Service at a cost of .0087c. per 1,000 gallons. There were unloaded at the railroad siding at this station 52 carloads of coal weighing 3,181,100 pounds.

The Druid Hill Park electric plant, which was placed in operation on February 5, has consumed 1,578,973 pounds of coal. Minor repairs were made to main pumps, auxiliary pumps, boiler feed pumps, piping, and other machinery.

A crack about four and three-quarter inches long was noticed in the side wall of the water end on number two side of engine No. 46, evidently caused by the pulsation of the pumps, and in order to prevent it from extending any further, a strong brace was connected with the flanges to secure it.

The water ends of both pumps were cleaned, the valve-seats and valves were faced off, and new springs applied where necessary. The link motion on both engines Nos. 46 and 90 were overhauled, and twenty-two new gun-metal bushings were used; over the boiler-room floor in front of the boilers there were placed eighteen castiron plates two feet by four feet, for making a smooth surface for hauling the coal car to and from the coal bins. The slate roof was repaired. There were placed in the station fourteen illuminating oil-lamps, five in the engine-room, four in the basement and five in the boiler-room. Steam pipe connections were also made from the exhaust pipe, from the dynamo-engine to the auxiliary feed water heater, to help to heat the feed water while the dynamo is in operation. Some repairs were made and painting done at the engineer's residence at the station, also the gate at the coal siding was repaired.

The stable at this station was thoroughly overhauled, joints were pointed up, wire frame and screens were placed on all the windows and doors, as well as the cupola on the roof, to prevent setting the building on fire by the live sparks from the engine which pass by on the railroad nearby. The exterior was painted and the interior whitewashed.

The machine-shop has been running full time during the year, and turned out complete 469 gate valves from 2 inches to 10 inches in diameter, 76 fire hydrants, 6 double steamer nozzle fire hydrants, 9 street fountains, 25 meter strainers, 48 meter box covers, 742 screws for sealing meters, 11 tapping clamps. Extensive repairs were made to 159 gate valves from 2 to 6 inches in diameter, 23 fire hydrants, 18 street fountains, and to water meters of different sizes—131 Worthington, 13 Empire, 15 Union, 6 Hersey disc, 20 Hersey rotary, 23 Forrest, 4 Crown and 1 Magria; 61 meters of various sizes and make were inspected and slight repairs made to meters in service.

Repairs were also made to the shop-engine, shafting, lathes, piping and other shop machinery.

Alterations were made to the meter testing device; a great deal of miscellaneous work was done in the shops on bolts, screws, plates, and pipe nipples.

The shop elevator was equipped with a new ¾-inch steel cable and new safety device, and the elevator gate arranged to hoist in a more safe manner.

At the blacksmith shop there were dressed 1,096 lathe tools, 206 chisels, 24 drills, 17 cutters, heeled and toed 576 horse shoes, dressed 3 picks and 38 blacksmith tools; 919 horse shoes were put on Department horses.

Forged 23 wrenches, 15 lathe tools, 10 hammers, 20 scrapers, 54 hooks and plates, 9 awls and 8 wedges.

In the pattern shop new patterns were made for new Department designs of 3, 4, 6, 8 and 12-inch tapping clamps; 4, 6 and 8-inch spigot-end valves; solid plug for 6, 8, 10 and 12-inch valves; pipe plugs for 3, 4, 6 and 10-inch pipes; 2 and 4-inch special valves for meter-testing device, and 10 and 12-inch 4 way bell branches. Various patterns were also made for new parts for boilers, conveyor, pumps, air compressors, floor plate, hose clamp, pinion wheel, bars, etc.

A great deal of repair work was done on old patterns of branches for pipes, gate valves, fire hydrant, stop-cocks, etc.

The carpenters have erected an office in the meter-testing room, made 317 meter boxes of various sizes and 9 meter stands. Repaired 18 meter boxes and boxed piping at different locations. Repaired frame work of blacksmith shop, also Department carts and wagons, wheelbarrows, chairs, floor and posts in stable; fence and coal bins in Gay street yard. Shoved up force main in vault at Mt. Royal Pumping Station.

Applied new hardware on doors, windows, cupboards, desks and boxes; also erected scaffolding for repair work at the three pumping stations.

Made 2 step ladders, tool handles, boxed materials for shipment, etc.

The painters have touched up the paint work in the Eastern Station and stable in Gay street yard.

Painted the meter-testing room and office, scale cover and yard office, bins in storeroom, 2 step-ladders, case for recording instrument, seven derricks, 27 street fountains and lettered 22 signs. Cleaned and painted 796 fire hydrant covers.

They have also put in new window lights in the various department buildings.

The bricklayers have repaired the brick work in the furnaces and boilers at the three pumping stations.

They have repaved the driveway between the stables and wagon shed in Gay street yard, areaway between the machine shop and engine room, and driveway and gutters around Mt. Royal Station.

This Division has also inspected and superintended the work done by the hauling contractors in unloading all cast-iron pipe and large castings received by rail, and the delivery of them at the storage yard or where required for work on the streets.

Received 4,936 castiron pipes from 3 to 10 inches, weighing 2,400,344 pounds, 17 special castings weighing 25,942 pounds. The yard force have laid and rammed water drains —41 feet 6 inches of 4-inch pipe and 60 feet 6 inches of waste water pipe—from the machine and blacksmith shops. They also melted 11,679 pounds of scrap lead into pigs. They hauled 27 cart loads of coal weighing 72,080 pounds from Gay street yard to Mt. Royal Station, to keep the station in service, because the coal contractors were unable to deliver coal that was on order.

For the Engineering Division—Made two trestles, two drawers, one rack, planed and turned edge of one drawing board, six T squares, and forged one inspector's hammer.

For the Construction Division—Dressed and pointed 2,676 picks, 1,465 diamond. points, 535 chisels, 197 digging bars, 439 crowbars, 34 chisel bars, 33 lamp stands and rope guards, 499 pipe cutters, 2 hammers, 6 stone cutters, 14 lead ladders, 108 drills, 9 wedges and 9 axes.

Also repaired 48 hydrant keys, 64 socket and gallow keys, 17 chains, 10 roping tools, 46 caulking tools, 20 lead cutters, 20 Muller tapping machines, 7 ratchets, 36 saws, 6 tool boxes, tempered and ground 47 drills.

Made 30 set screws, 7 tool boxes for Muller tapping machine, 144 2-foot and 545 3-feet stop boxes, 1,759 cedar plugs and turned 20 rammer handles, branded 48 picks and 168 shovels, cut 500 gaskets.

Forged 30 roping tools, 8 keys for fire hydrants, 24 hydrant keys, 96 caulking tools, 12 allegator wrenches, 50 chisels, 30 links and 24 eye bolts.

Furnished parts for repairs to 27 street fountains and 12 fire hydrants at various locations.

Finished complete—150 ½-inch, 100 ¾-inch and 50 1-inch double-screw stop-cocks, 210 ferrule clamps and turned 16 wedges. Repaired 1 20-inch and one 36-inch gate valve in service. Applied 30-inch clamps on pipe at Henrietta and Howard streets.

Made one measuring board, 2 boxes, 3 driving points, 2 taps for 3 and 4-inch valves, 1 oak skid for wagons and a miscellaneous lot of small work.

For the County Division, Lake Clifton—Made two clamps, drilled two bands and dressed 67 harrow teeth, repaired water pipe in gate house and partly painted railing around reservoir.

Western High Service Reservoir—Painted iron railing and boat.

Hampden Reservoir—Made stand and frame for recording instrument and erected same. Painted railing and boat.

Guilford Reservoir—Made five pair of shutters and necessary repairs to the keeper's house, painted exterior, 2 outhouses and one boat.

Lake Roland—Forged 26 stone drills from 2 feet to 6 feet long.

Lake Montebello—Made one mortar box, repaired one hook, ornament on gatehouse, shaft for cart, one hay wagon and two-horse wagon, windmill, 17 top stands for models, 4 screens, 3 doors.

Dressed 3 mattocks and 7 picks, forged 4 latches and 1 bolt, scraped and painted roof and painted exterior of gatehouse.

Loch Raven—Made 150 stakes, tables for recording instruments, forged 5 chisels, 16 eye bolts, 8 handles, 2 star drills and 20 bolts, cut off 8 pieces of 1-inch galvanized iron pipe for hand rail, and erected running boards for coal bin; also painted 8 stop planks.

Attached please find statement of the operation of pumps at the three pumping stations.

Respectfully submitted.

EDWARD G. ROST,
Superintendent of Mechanical Division.

MECHANICAL DIVISION.—Operation of Pumps.

Annual Report, December 31, 1902.

		Pumps.	Hours Worked.	Gallons of Water Pumped.	Coal Consumed in Pounds.	Duty.	Gallons of Water Pumped Per Lb. of Coal.	Cost of Pumping.	Cost of Pumping 1,000 Gals. in Cents.
Eastern Pumping Sta.	M. S.	839	None.						
	E. H. S.		3,340.15	1,170,458,858.70	2,978,989	62,163,275	391.3	$6,962 37	$.0060
	M. S.	1,207	5.15	2,075,382.00	3,400	25,808,615	610.4	9 39	.0045
	E. H. S.		6,986.45	2,362,723,712.85	5,536,869	65,670,854	390.0	13,829 93	.0059
Western Pumping Sta.	W. H. S.	46	469.18	73,551,565.00	193,219	42,049,298	357.4	645 41	.0087
	U. S.		311.11	39,572,640.00	169,515	66,818,484	235.3	490 71	.0123
	W. H. S.	90	445.43	69,842,016 00	182,265	42,192,732	384.6	611 59	.0087
	U. S.		335 35	43.297,488.00	188,194	66,571,161	233.4	541 30	.0122
Mt. Royal Pumping Sta.	M. S		695.30	567,121,736 13	643,716	37,373,492	883.6	1,589 52	.0029
	W. H. S..	1,208	3,064.25	2,015,176,267.95	5.849,640	54,326,137	348.2	10,861 13	.0053
	W. H. S..	1,209	3,697.50	2,512,553,739.66	7,407,460	53,197,436	341.6	13,379 17	.0053

REMARKS.

6-in. valve at E. P. Station ½ open to middle service	533	hours.
6-in. valve at E. P. Station full open to middle service	3,676	"
6-in. valve in Mt. R. P. Station ½ open to middle service	1,038¼	"
6-in. valve in Mt. R. P. Station full open to middle service	3,843¼	"
10-in. valve at Harford and North avenue ⅜ open to middle service	2,994⅜	"
6-in. valve at Biddle and Park avenue full open to middle service	509	"
6-in. valve at Biddle and Bolton full open to middle service	509	"
3-in. Fountain run in Druid Lake	379¼	"

Report of Superintendent of County Division

For the Year Ending December 31, 1902.

Mr. A. M. Quick, *Water Engineer.*

Sir:—The rainfall on the Jones' Falls Supply was 51.67 inches.

The water in Lake Roland was too muddy to use for 38 days, and was below the crest of the dam 144 days, the minimum being 12.72 feet on September 8 and 9. The maximum flow over the dam was 3.0 feet on September 26.

The Towson Branch has been cleaned out down to its original depth, from the N. C. R. R. to the Sand Trap; and the Jones' Falls Branch has been widened and deepened from the Green Spring Branch N. C. R. R. up to back water. 5,975 feet of riprapping has been laid along both sides of the Jones' Falls Branch.

About 4 p. m. December 28, Samuel G. Morgan, while skating, broke through the ice and was drowned. The body was recoved at 6.45 p. m. by George Carrick, Charles Carrick and James Harrman, working under the direction of John Boone. I again recommend that boating and skating be prohibited on the lakes and reservoirs of the department.

Realized from the sale of fodder, sand, wood, ice, etc., $544.66.

The Jones' Falls Conduit has continued in good order, and has been of no unusual expense.

The minimum water in Hampden Reservoir was 138 feet on March 9. A water gauge has been placed in the gate-

house. The iron railing has been painted by the department painters, and a cinder path has been built along the western boundary of the property outside of the hedge.

The minimum water in Druid Lake was 13.8 feet on March 9. A slip in the riprapping on the northwest slope occurred in March; this was repaired and has caused no further trouble.

There were 82,870,128 gallons pumped from the Western Pumping Station to West Arlington Standpipe; both standpipe and adjacent grounds are in good condition.

The rainfall on the Gunpowder Supply was 50.87 inches.

The water in Loch Raven was too muddy to use for 75 days and was below the crest of the dam 54 days. The maximum flow over the dam was 4.0 feet on February 23d. The new dredge was put in commission June 17th and continued operating until December 6th, when it was laid up in winter quarters. There is now a clear basin for 3,800 feet above the dam, with an average depth of 12 feet; 411,460 cubic yards were removed, including 12,000 cubic yards from the dock. The percentage of solid matter varied from 3 to 64 and averaged 23.3. Total cost of operating was $18,171.43. Considerable vibration was caused by the engine which operated the fan. This was remedied by disconnecting the engine and running the fan by belt from the shop engine. The deck under the boilers has settled and the sides of the hull bulged. Additional struts were placed under the boilers, but did not remedy the defect. The bow has settled about six inches out of line. These defects should be remedied before spring, so that she will be ready to be put in commission when the season opens. A hay barrack has been built at the upper end of the lock. Water has been introduced into the keeper's house by installing a hydraulic ram at a cost of $256.00, and a coal bin has been constructed on the bank of the loch for use of the dredge. In addition to fur-

nishing all the corn and straw used by the horses at Montebello and the Mechanical Division, $1,350.70 has been realized from the sale of corn, rye, straw, hay and rent.

The minimum water in Lake Montebello was 21.4 feet on July 5th. In March, when the water was low, there were two holes discovered in the north slope near the east end of the reservoir, about 12 feet below the water surface. Upon investigation it was found that the water was making into the drain tunnel. Cement grout was run into these holes until they became choked; then clay was filled in to bring it up to the slope. While water is still making into the tunnel, it is clear, showing no sign of discoloration. There were also two slips in the riprapping, one on the north and the other on the south side; these have been repaired. A water gauge has been installed in the gatehouse. Enough hay was raised here to supply all the horses, both here and at the Mechanical Division, and to leave a balance to be sold, from which was realized $261.70.

The minimum water in Lake Clifton was 21.7 feet on July 6th. The grounds and buildings have been kept in their usual good condition. Pending repairs to Lake Montebello, the water was received into this lake direct from Loch Raven.

Mt. Royal Reservoir has been kept full during the year, but has not been called upon to furnish any part of the supply.

Guilford Reservoir has been kept practically full during the year, and has been of no unusual expense. The old wire fence has become rather dilapidated and should be replaced with an iron railing.

The minimum water in Western High Service Reservoir was 5.2 feet on July 9th. The surface of the path nearthe

screen well has settled twice during the year, the last time being in November, these were filled up, well rammed, and the path resurfaced.

The pumps at the Eastern Pumping Station pumped 3,006,359,083 gallons to the High Service, and 504,342,379 gallons to the Middle Service.

The pumps at the Mt. Royal Pumping Station pumped 4,045,618,007 gallons to the High Service, and 1,043,790,228 gallons to the Middle Service.

The Inspectors of the Water Shed report 65 abatements, 9 on the Jones' Falls Supply and 56 on the Gunpowder. Whenever the Inspectors have been unable to accomplish an improvement, the case has been taken up by the office; through this means a number of the abatements have been accomplished. I have heard of no action having been taken by the Law Department on the two cases which were referred to it last year.

For detailed statement of flow, consumption, etc., see accompanying tables.

Respectfully submitted.

William Benthall,
Superintendent County Division.

DEPARTMENT OF PUBLIC WORKS—SUB-DEPARTMENT WATER BOARD.

Table of Rainfall in Inches.

1902.	Jones' Falls Supply.			Gunpowder Supply.					
	Lake Roland.	Hampden Reservoir.	Druid Lake.	Loch Raven.	Lake Montebello.	Lake Clifton.	Mt. Royal Reservoir.	W. H. Service Reservoir.	Guilford Reservoir.
January	3.60	3.72	2.73	3.32	3.27	3.76	2.99	3.22	3.38
February	5.60	6.16	4.94	5.34	5.02	5.19	4.28	5.55	5.07
March	3.79	4.07	3.55	3.73	3.95	3.25	4.28	3.81	3.99
April	3.69	3.96	3.26	4.64	3.64	3.85	3.20	3.11	3.04
May	1.03	1.35	1.45	1.06	1.21	1.20	1.45	1.40	1.02
June	5.67	5.21	5.50	5.52	5.03	4.84	3.81	5.35	4.67
July	2.71	2.65	2.89	2.01	3.08	2.82	3.02	2.77	3.50
August	0.48	2.61	3.01	1.26	1.97	2.52	2.30	2.81	0.93
September	9.22	5.01	8.44	9.06	8.18	8.79	7.17	6.72	7.73
October	4.40	5.95	7.04	6.36	5.70	5.59	7.40	6.50	6.85
November	3.82	3.85	3.47	3.69	3.76	4.03	2.93	3.66	3.50
December	6.20	7.30	6.69	6.64	6.19	5.98	5.47	7.00	5.91
Totals	50.21	51.84	52.97	52.63	51.00	51.82	48.30	51.90	49.59

FLOW, CONSUMPTION AND WASTE, GUNPOWDER SUPPLY, 1902.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Clear water over dam, per month	2,204,866,794	2,533,870,495	3,754,304,603	5,421,562,400	4,103,056,766	1,270,031,231	702,906,282	251,619,539	202,693,691	1,858,839,842	2,975,295,716	6,119,529,971	31,398,577,330
Muddy water over dam, per month	5,229,164,236	10,100,733,731	8,137,892,294	2,987,207,072	616,311,578	2,667,616,736	1,597,713,239	244,779,268	3,006,392,717	3,718,539,840	424,923,840	5,903,259,675	44,634,534,226
Waste from drain gates, Loch Raven	1,015,597,509	837,284,448	1,572,167,342	2,169,719,466	1,536,646,440	1,321,763,136	684,091,126	904,984,150	428,221,989	1,129,616,600	602,777,880	873,909,129	13,076,779,215
Clear water through conduit gates	1,573,348,023	715,698,561	1,252,933,505	853,395,613	1,292,011,459	1,110,483,797	1,741,959,299	1,422,007,838	1,862,994,390	1,955,594,532	1,417,973,451	1,275,550,793	16,473,951,261
Total flow of stream per month	10,022,976,562	14,187,587,235	14,717,297,744	11,431,884,551	7,548,026,243	6,369,894,900	4,726,669,946	2,823,390,795	5,500,302,787	8,662,590,814	5,420,970,887	14,172,249,568	105,583,842,032
Average flow of stream per day	323,321,825	506,699,544	474,751,211	381,062,618	243,484,718	212,329,830	152,486,127	91,077,122	183,343,426	279,438,413	180,699,029	457,169,341	289,270,800
Spring water making into conduit	93,000,000	84,000,000	93,000,000	90,000,000	93,000,000	90,000,000	93,000,000	93,000,000	90,000,000	93,000,000	90,000,000	93,000,000	1,095,000,000
Waste from drain gates, Lake Montebello	33,537,225	60,076,735	18,368,250	41,499,300	2,969,036	17,367,624	.....	27,987,900	.....	90,251,647	27,505,350	22,197,300	341,760,367
Waste over weirs, Lake Montebello	30,772,074	38,402,052	.....	26,290,326	21,774,427	7,574,308	426,536	34,136,084	.....	175,088,011	45,290,742	29,237,346	408,991,906
Rainfall, Lake Montebello, in inches	3.27	5.02	3.95	3.64	1.21	5.03	3.08	1.97	8.18	5.70	3.76	6.19	51.00
Rainfall, Lake Montebello, in gallons	5,313,734	8,157,475	6,418,733	5,914,982	1,966,244	8,173,725	5,004 985	3,201,240	13,292,459	9,262,472	6,109,981	10,058,719	82,874,749
Gain or loss in Lake Montebello	+ 112,937,153	— 144,218,306	+ 59,075,568	+ 9,749,970	+ 30,874,905	— 248,624 235	+ 243,749 250	— 43,874,865	+ 50.374,845	+ 22,749,930	+ 9,749,970	— 2,031,244	.....
Water sent to Lake Clifton	1,401,415,305	853,595,555	1,274,909,420	871,770,999	1,331,359,335	1,432,339,825	1,596,215,034	1,499,959,959	1,915,912,004	1,769,767,416	1,431,537,370	1,329,206,110	16,707,988,332
Waste from drain gates, Lake Clifton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waste over weir, Lake Clifton	168,862	873.263	327,170	656,311	304,833	51,704	.....	527,784	.....	6,446.836	1,221,579	368,715	10,947.057
Rainfall, Lake Clifton, in inches	3.76	5.19	3.25	3.85	1.20	4.84	2 82	2.52	8.79	5.59	4.03	5.98	51.82
Rainfall, Lake Clifton, in gallons	3,247,933	8,483,184	2,807,389	3,325,676	1,036,374	4,180,850	2,435,950	2,176,806	7,592,907	4,828.709	3,481,162	5,165,596	48.762,536
Gain or loss in Lake Clifton	+ 63,274,229	— 78,822,845	+ 54,420,156	+ 9,501,932	+ 15,548,616	— 132,163,236	+ 129,571,890	— 25,914,360	+ 23,322,924	+ 10,365.744	+ 7,774,308	— 3,455,248	.....
Rainfall, Mt. Royal Reservoir, in inches	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rainfall, Mt. Royal Reservoir, in gallons	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gain or loss Mt. Royal Reservoir	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total sent to city per month	1,341,220,147	940,028,321	1,222,969,483	864.938,432	1,316,542,260	1,568,632,207	1,469,079,184	1,527,523,341	1,900,182,087	1,757,783.545	1,421,503,479	1,337,458,239	16.667,860,725
Average sent to city per day	43,265,166	35,572,440	39,444,177	28,831,271	42,469,105	52.287,740	47,389,651	46,049,140	63,339,736	56,702.695	47,383,449	43,143,814	45.665.372
Total waste per month	8,514,106,700	13,571,240,724	13,483,059,659	10,646,934,875	6,281,063,080	5,284,404,739	2,985,137,183	1,464,034,725	3,637,308,397	6,978,782,776	4,077,015,107	12,948,502,136	89,871,590,101
Average waste per day	274,648,603	484,687,170	434,937,408	354,897,829	202,614,938	176,146,824	96,294,748	47,226,927	121,243,613	225,122,025	135,900,504	417,693,617	246,223,535

FLOW, CONSUMPTION AND WASTE, JONES' FALLS SUPPLY, 1902.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Clear water over dam, per month	45,530,261	1,191,367,006	433,576,016	894,369,594	212,449,065	262,365,575	48,699,533			130,152,718	235,917,056	1,291,042,884	4,745,469,708
Muddy water over dam, per month	178,223,105	465,092,995	575,979,888						1,047,161,984	262,218,401			2,528,676,373
Waste from drain gates, Lake Roland	522,618,231	293,642,761	645,318,926	338,156,269	143,746,740				183,924,721	472,398,213	52,816,242	336,416,860	2,989,038,963
Clear water through conduit gates	184,804,547	406,841,820	457,384,876	499,926,783	480,330,531	489,456,921	610,054,666	479,528,787	205,936,145	318,808,718	405,240,434	417,517,548	4,955,831,776
Total flow of stream, per month	931,176,144	2,356,944,582	2,112,259,706	1,732,452,646	836,526,336	751,822,496	633,754,199	379,528,787	1,437,022,850	1,183,578,050	693,973,732	2,044,977,292	15,219,016,820
Average flow of stream, per day	30,037,940	84,176,592	68,137,409	57,748,421	26,984,721	25,060,750	20,443,685	12,242,864	47,934,099	38,179,937	23,132,458	65,967,009	41,695,936
Waste from Harper's Waste Weir													
Clear water sent to Hampden Reservoir	184,804,547	406,841,820	457,384,876	499,926,783	480,330,531	489,456,921	633,754,199	479,528,787	205,936,145	318,808,718	405,240,434	417,517,548	4,955,831,776
Rainfall in Hampden Reservoir, in inches	3.72	6.16	4.07	3.96	1.35	5.21	2.65	2.61	5.01	5.95	3.85	7.30	51.84
Rainfall in Hampden Reservoir, in gallons	806,753	1,335,919	882,661	858,805	272,775	1,129,893	584,706	566,031	1,086,519	1,290,377	833,950	1,581,151	11,229,540
Gain or loss in Hampden Reservoir	— 6,235,013	— 8,295,278	+ 14,747,160	— 271,087	+ 487,958	+ 1,084,350	— 3,036,180	— 2,819,310	— 3,469,920	+ 14,964,030	+ 260,244	— 271,087	
Water sent to Druid Lake by gravity	185,611,303	416,473,017	443,520,377	501,056,675	480,115,348	489,502,464	637,375,085	482,914,128	210,492,584	305,135,065	405,814,140	419,369,786	4,977,379,972
Rainfall in Druid Lake, in inches	2.73	4.94	3.55	3.26	1.45	5.50	2.89	3.01	8.44	7.04	3.47	6.69	52.79
Rainfall in Druid Lake, in gallons	4,310,807	7,700,507	5,605,628	5,147,703	2,289,623	8,684,775	4,563,455	4,752,940	13,327,182	11,163,884	5,479,304	10,563,845	83,589,653
Waste from Druid Lake													
Gain or loss in Druid Lake	— 98,690,625	+ 20,527,650	+ 26,843,850	— 5,526,675	+ 15,000,975	+ 33,160,050	— 71,057,250	— 6,316,200	+ 7,895,250	+ 39,476,250	+ 18,948,600	+ 5,526,675	
Total sent to City, per month	288,612,735	403,645,874	422,282,155	511,731,053	467,403,996	465,027,189	712,995,790	493,983,268	215,924,516	276,822,699	392,344,844	424,406,956	5,075,181,075
Average sent to City, per day	9,310,088	14,415,924	13,622,065	17,057,702	15,077,548	15,500,906	22,999,864	15,934,944	7,197,487	8,929,764	13,078,161	13,690,547	13,904,606
Total waste, per month	746,371,597	1,950,102,762	1,654,874,830	1,232,525,863	356,195,805	262,365,575	48,699,533		1,231,086,705	864,769,332	288,733,298	1,527,459,744	10,163,185,044
Average waste, per day	24,076,503	69,646,527	53,383,059	41,017,529	11,490,187	8,745,519	1,570,953		41,036,223	27,895,785	9,624,443	49,272,895	27,844,343

STANDPIPE HIGH SERVICE AND RECAPITULATION, 1902.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
From W. P. Station to Upper Service	4,249,224	4,522,392	6,457,248	5,739,120	7,639,848	9,531,936	9,516,024	9,495,072	7,744,176	6,318,648	5,549,688	6,106,752	82,870,128
From W. P. Station to W. H. Service	8,229,816	26,383,248	47,759,256	61,022,232									143,394,552
From Mt. R. P. Station to High Service	170,845,958				632,580,816	534,846,357	483,721,508	479,805,771	457,323,979	455,876,210	427,775,216	402,842,192	4,045,618,007
From E. P. Station to High Service	283,112,902	420,059,031	483,127,007	493,730,225		245,396,290	210,474,253	158,783,914	209,960,410	160,956,889	161,598,228	179,159,934	3,006,359,083
From E. P. Station to Middle Service	35,850,000				2,075,382			110,481,308	65,120,064	111,900,000	99,000,000	79,915,625	504,342,379
From Mt. R. P. Station to Middle Service	143,425,000				16,925,000		19,900,000	105,037,800	405,692,230	224,785,198	56,750,000	71,275,000	1,043,790,228
HIGH SERVICE RESERVOIRS.													
Rainfall in High Service Reservoir, in inches	3.22	5.55	3.81	3.11	1.40	5.35	2.77	2.81	6.72	6.50	3.66	7.00	51.90
Rainfall in High Service Reservoir, in gallons	474,435	817,737	561,365	458,227	206,276	788,269	408,132	414,025	990,125	957,710	539,286	1,031,380	7,646,967
Gain or loss in High Service Reservoir	— 2,836,295	— 4,751,715	+ 1,620,740	— 3,057,235	+ 5,893,600	736,700	+ 331,515	— 1,362,060	+ 1,915,420	+ 1,320,740	— 353,616	+ 1,399,730	
Rainfall in Guilford Reservoir, in inches	3.38	5.07	3.99	3.04	1.02	4.67	3.50	0.93	7.73	6.85	3.50	5.91	49.59
Rainfall in Guilford Reservoir, in gallons	637,116	955,675	752,099	573,028	192,266	880,276	660,736	175,261	1,457,074	1,281,198	659,736	1,114,011	9,338,476
Gain or loss in Guilford Reservoir	+ 1,460,844				— 188,496	1,696,464	+ 1,507,968	— 2,638,944	+ 1,696,464	— 565,488	+ 1,130,976	— 659,736	
RECAPITULATION.													
Total Upper Service Consumption	4,249,224	4,522,392	6,457,248	5,739,120	7,639,848	9,531,936	9,516,024	9,495,072	7,744,176	6,318,648	5,549,688	6,106,752	82,870,128
Total High Service Consumption	464,675,678	452,967,406	530,578,987	558,840,947	625,524,254	687,945,956	686,525,146	634,918,975	603,669,704	580,166,755	589,295,096	583,407,523	6,998,516,427
Total Middle Service Consumption	455,408,695	372,740,234	368,065,651	444,969,701	480,514,530	550,420,253	684,795,790	699,007,304	741,442,634	645,347,249	543,145,156	569,490,829	6,555,348,026
Total Low Service Consumption	707,986,287	519,969,290	739,842,476	371,208,207	664,961,062	788,389,560	811,983,423	673,414,548	772,085,404	804,265,248	676,380,035	604,265,488	8,134,751,028
Total Consumption per month	1,632,319,884	1,350,199,322	1,644,944,362	1,380,757,975	1,778,639,694	2,036,287,705	2,192,820,383	2,016,835,899	2,024,941,918	2,036,097,900	1,814,369,975	1,763,270,592	21,771,485,609
Average Consumption per day	52,655,158	48,221,404	53,062,721	46,025,266	57,375,474	67,876,257	70,736,141	65,059,222	67,498,064	65,680,545	60,478,999	56,879,697	59,647,906

Total consumption through meters for the year 4,827,505,494
Average " " " per day 13,226,042

Forty-third Annual Report

—OF THE—

BOARD OF PARK COMMISSIONERS

—TO THE—

Mayor and City Council of Baltimore

—FOR THE—

FISCAL YEAR ENDING DECEMBER 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

Wallace Statue—Druid Hill Park.

Board of Park Commissioners

—— OF THE ——

City of Baltimore, Md.

THOMAS R. CLENDINEN, *President.*
JOHN P. GALVIN,
COL. BRENT WATERS,
EDWARD J. GALLAGHER,
EDWARD D. BOOZ.

STANDING COMMITTEES.

Finance:	Commissioners	BOOZ AND WATERS.
Improvements:	"	BOOZ AND WATERS.
Supplies:	"	GALVIN AND BOOZ.

EXECUTIVE COMMITTEE.

COMMISSIONERS WATERS, GALLAGHER AND GALVIN.

PARK COMMITTEES.

Druid Hill, - - -	Commissioners	GALLAGHER AND GALVIN.
Clifton, - - - -	"	WATERS AND GALLAGHER.
Carroll, - - - -	"	WATERS AND BOOZ.
Patterson, - - -	"	GALLAGHER AND WATERS.
Riverside, - - -	"	BOOZ AND GALVIN.
Federal Hill, - - -	"	GALLAGHER AND GALVIN.
Locust Point, - - -	"	GALVIN AND WATERS.
Moale's Point, - - -	"	BOOZ AND GALVIN.
Gwynn's Falls, - - -	"	BOOZ AND GALLAGHER.

Druid Lake Looking North from Madison Avenue Entrance—Druid Hill Park.

OFFICERS

— OF THE —

BOARD OF PARK COMMISSIONERS.

J. V. KELLY, Secretary-Treasurer.
CARL K. MENGEL, Stenographer.
G. ARCHER HAYS, Clerk.

SUPERINTENDENTS.

William H. Cassell, – – –	Druid Hill District.
Noah F. Flitton, – – –	Clifton District.
Charles L. Seybold, – – –	Patterson District.
Harry S. Sinclair, – – –	Carroll District.
J. Fred. Wessler, – – –	Riverside and Federal Hill.

South from Prospect Hill—Druid Hill Park.

REPORT

OF THE

Board of Park Commissioners.

Baltimore, December 31, 1902.

To the Honorable, The Mayor and City Council of Baltimore.

Gentlemen: In accordance with Section 5, of Ordinance No. 60, approved July 21, 1860, the Board of Park Commissioners is required to furnish each year a full account of its operations.

This Report, having been adopted by the Board, is herewith presented, and together with that of the Secretary-Treasurer, which follows, will constitute the Forty-Third Annual Report for the year ending December 31, 1902.

No substantial or permanent improvements were undertaken during the year 1902, because of the necessity of confining expenses within the extremely narrow limits of the funds available for park purposes.

As was stated in our forty-second Annual Report, "it cannot be too strongly emphasized that our park system has outgrown in its demands the revenues secured to it by the tax on the street railway franchise."

"The growth of the City, and the increase in the street railway traffic, has caused this tax to increase from $33,000 under the twenty per cent. rate in 1860, to $304,158.55 in 1901 ($324,397.94, in 1902), under the present nine per cent. rate, but even this large increase has failed to keep pace with

the demands made upon this Department of the City Government. Until 1891, when the receipts were $179,000, only the maintenance of Druid Hill and Patterson Parks was required to be paid out of the park tax, all other parks and squares being maintained out of revenues derived from general taxation; in that year, however, not only did the improvement and maintenance of all the parks and squares become chargeable to the park fund, but the purchase of Carroll Park the previous year added over 35 acres to the park area, and this was very materially increased 4 years later by the acquisition of over 250 acres, now known as Clifton Park. This later increase being accomplished, as it was, by the use of a portion of $1,000,000 set apart from what is known as "The Four Million Dollar 1945 Loan," not only enlarged the park area and thereby created an additional demand on the park fund for improvement and maintenance, but at the same time actually depleted that fund by adding to the $8,000 interest charges already existing on the Patterson Park Extension Loan, over $37,000 for interest and sinking fund on the new loan. The extension of Carroll Park, the purchase of Gwynn's Falls and Locust Point Parks, have increased these charges until now over $53,000 a year of the money necessary for the maintenance and support of the increased number of parks is taken away to meet these charges."

Prior to the present City Charter, the Park Board had at its disposal, in each year, the entire nine per cent. of the gross receipts of the street railways for that year, and could control the expenditure of this sum by increasing or decreasing the purchases of materials and correspondingly reducing or adding to the number of employees in the parks, as necessity required. This control afforded some measure of relief, in contingencies, from a situation which has become even more difficult to meet under the requirements of the new City Charter, which takes away this control. The Board must

PHILOSOPHERS' WALK—DRUID HILL PARK.

now go to the Board of Estimates, in the fall of each year, with an estimate—*not* of what will be required to properly maintain the parks and squares for the succeeding year, as other Departments do, but with an estimate of the limited and grossly inadequate amount which the street railway tax may be expected to produce, and ask that this amount be allowed—so much for "salaries" and so much for "expenses" (materials), thereby becoming bound, when the items are allowed in the Ordinance of Estimates, to confine the expenditures within each of the narrow channels, whatever contingencies may arise during the year to make a different division of the entire pittance more prudent.

Notwithstanding the resulting difficulties with which the Department has had to contend, it has succeeded, during the past year, in choking itself into compliance with the requirements made upon it.

In previous years accounts were kept only of cash receipts and payments. As a result there were for years, at the close of each year, unpaid claims running into the thousands, of which no account was taken in the report of the Secretary-Treasurer, and which were held over and paid out of the receipts of the succeeding year, thus avoiding the showing of a deficit where a shortage actually existed.

The bringing of the Department under the operations of the New Charter before a change in this system of accounting was made, necessarily placed the Park Board in an embarrassing position and brought about a prompt reform. The first of January, 1902, marked the beginning of an entirely new method of bookkeeping, the result of which is shown by Table "C," in the report of the Secretary-Treasurer, which follows. Tables "A" and "B" show briefly and compactly what has been spread over many pages in previous reports.

While the Board has thus been able to keep watch upon its expenditures and meet the requirements of the Charter,

it has done so at a sacrifice of needed improvements and of the highest standard of maintenance, and has been unable, to any extent, to comply with the demand for the development of the newly acquired park property.

Reports upon the several parks follow.

DRUID HILL PARK.

(671.21 Acres. Acquired 1860. Cost $695,154.65.)

Entrances, Drives and Footways.

An entrance of thirty feet in width was opened during the year 1902, leading in from the Orem property on the West side of the Park, called "Orem" or "West Entrance." Three hundred and ten feet of well-constructed roadway, broadening out on either side of the Entrance to a width of ninety feet, was made at this point. This entrance roadway is well drained, with neat and appropriate gutters.

The Entrances from Mt. Royal Avenue, Eutaw Place, Madison Avenue and Druid Hill Avenue, have been adorned with flower beds of beautiful and attractive designs. These were first constructed in 1901. The quality as well as the quantity of plants used in these beds during the past year has demonstrated the advantages of park propagating houses.

The Park Drives have been extensively repaired, and in some places reconstructed. The material used has all come from the Park Quarry of "Rotten Rock," which has been worked without cessation during the entire year. Over 12,068 square yards of this material have been taken out, crushed to a proper size and distributed over the Drives. The rotten rock being soft and elastic, has proven quite desirable for pleasure roads, and its comparatively small cost has enabled the Board to make appreciable improvements in the roads in Druid Hill. In all, nine thousand and forty-two lineal feet of roadway have been repaired during the year.

Twin Beach Drive—Druid Hill Park.

A footway eight feet in width was constructed along the park line from Orem Lane to the Cycle Path, a distance of eight hundred feet.

Buildings.

Two new buildings have been completed during the year. In addition to the wagon shed, 129 by 81 feet, which was roofed and painted at the beginning of the year, an octagonal shaped animal shelter, forty feet in diameter and two stories high, was erected at the "Zoo." This is divided into eight compartments, for camels, wolves, burros, and so forth, and enclosed with a steel wire fence, six feet high, giving each compartment a yard forty by sixty feet. The building is well and substantially constructed and the design in every way suitable to its surroundings.

Gardening Department.

Since the erection of the propagating houses in 1901, the Gardening Department has grown to considerable proportions. The additional expense entailed by the stocking and growth of this Department has, however, already been largely compensated for by the large number and the excellent quality of the plants propagated during the year 1902. The demands of the Druid District, including the Eutaw Place Squares, Park Place and Fulton Avenue Squares, Liberty and Linden Triangles, were abundantly taken care of. These squares and triangles were improved during the year with 1618 loads of first-class compost, as well as kept beautiful with flowering and foliage plants.

The Zoo.

The collection of animals and birds, while still small, has been increased by two Russian Bears, one Cinnamon Bear,

a ring-tailed monkey and a bald eagle. The "Zoo" has been popular with visitors to the Park, especially children. In addition to the animal shelter, spoken of under the heading of buildings, two cages or "dens," twenty-five by ten feet, were constructed for the bears. These "dens" are provided with running water baths and have iron bar fronts protected by iron railings. The Elk enclosure has been extended to a point near Silver Spring and divided into several sections.

Athletics.

The ball grounds have been extensively used, 502 baseball and 102 football permits having been issued during the year. The baseball field is badly in need of improvements. It has suffered from the heavy rains and can be put in first-class condition only at considerable expense.

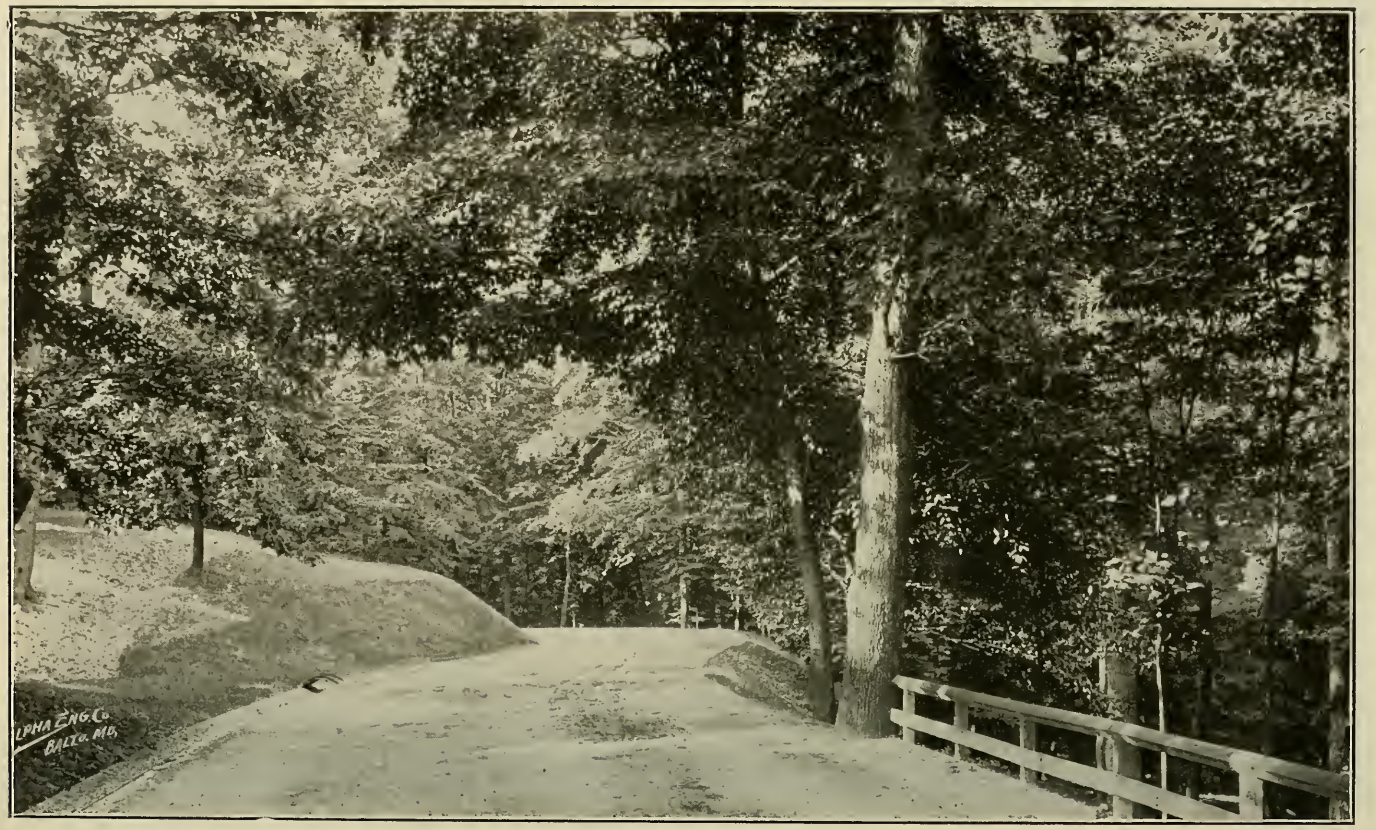
The tennis courts have been maintained in the best of condition and have been especially popular, being always crowded in seasonable weather.

Playgrounds.

The Children's Playgrounds established in 1900, have attracted hundreds of children, every pleasant day, and the Playground Association, under whose auspices the children are looked after, is doing a splendid work.

Picnic Groves.

Four hundred and sixty-three picnics were held in Druid Hill during the year, several by out of town parties from York, Parkton, Reisterstown, Towson, Mt. Washington and Shrewsbury.



Crow's Nest Road—Druid Hill Park.

Gardener's Home—Clifton Park.

General.

Five new carts were made in our own shop at Druid Hill. Also one large double wagon and one single wagon. These are strong and far superior, in the Superintendent's judgment, to those purchased in the market. The lumber wagon and one dray were rebuilt.

Lighting Plant.

The new lighting plant in Druid Hill did not go into operation until March 1, 1902. It has continued in charge of the Electrical Commission and is sufficiently dealt with in the Annual Report of that Commission.

CLIFTON PARK.

(254.75 Acres. Acquired 1895. Cost $725,535.81.)

Greenhouses.

The beneficial effect of the park greenhouses, erected in the years 1900-01, from economic and æsthetic standpoints, was most fully demonstrated in the past year. It has rendered available not only a larger quantity of plants but plants of of a far superior quality to those formerly purchased with the funds at the disposal of the Park Board.

There are in the greenhouses at Clifton Park more than seven thousand Crotons (Codiæum); these at a conservative estimate are worth $4,000. They are used with excellent effect in the District, notably on Mt. Royal Avenue and the Squares of Mt. Vernon Place, and in smaller proportion throughout the District.

In addition to this, the houses have afforded an opportunity for the cultivation of some of the more rare tropical water lilies, including the Victoria Regia. The area, however, for the growing of these tropical acquatics, is somewhat

limited, and improved facilities and an increased area for this purpose is desirable, and would be greatly appreciated by the public, as was attested in the past season by the large number of visitors who were attracted to the park by this especial feature.

The number of plants raised at Clifton Park during the season just closed was 109,200, which were distributed as follows among the Squares in Clifton District:

Collington Square	5,681
Johnson Square	6,768
Mt. Vernon Square	10,716
Mt. Royal Station	6,989
Mt. Royal Squares	4,993
Mt. Royal Terraces	5,571
Taney Place	1,803
Public School No. 3 by request	450
Retained at Clifton	66,229
Total	109,200

Gardening.

Although few new flower beds have been laid off, considerable work in the line of improvement has been done in changing, enlarging and rearranging flower beds in various parts of the district. Inasmuch as the flower beds in public parks are very largely viewed from a distance, the massing of foliage and flowers commends itself, and this system of planting has been generally carried out in the Clifton District.

Our large supply and many varieties of Crotons were used to great advantage in this work, making a beautiful effect from the time they are planted until they are removed in the autumn, and are as interesting and beautiful when removed to their winter quarters in the greenhouses.

Mansion in Clifton Park—From Harford Avenue Entrance.

The improvements on Mt. Royal Avenue and Mt. Royal Terraces, as time develops them, are better understood, and hence are more fully appreciated by the public.

Nursery.

The nursery in this park contains a varied assortment of both evergreen and deciduous trees and shrubs, but not sufficient for the needs of the district. Its stock has been drawn upon for planting in the park during the year.

Driveways and Paths.

Some driveways have been re-surfaced with gravel procured in the park; new walks made where necessary.

Four hundred feet of terra cotta pipe has been laid for draining purposes in connection with the roads, and three hundred feet of cement gutter have been put down.

Athletics.

The baseball diamond, the football gridiron and the tennis courts are all that can be desired, and give universal satisfaction to the patrons.

Playgrounds.

The children's playground with its swings, merry-go-rounds, see-saws, etc., is a source of enjoyment to the hundreds of children who spend much of the time here during vacation.

Miscellaneous.

The acquisition by the city of the ice ponds in the north-east end of the valley adjoining the park, fronting on Bel Air Avenue, containing an area of about four acres, would seem

to be an imperative necessity. The water flows through the park into the ponds, and discharges into the park from the ponds, rendering the water unavailable for use in the parks, and in addition to destroying the natural beauty of the valley within the park, it obstructs the very desirable development of what could be inexpensively made one of the most charming spots in the park.

The connecting of Lake Montebello with Clifton Park has greatly enhanced and proportionately increased pleasure driving in the district. In the not distant future, this park will, without doubt, be connected with Wyman and Druid Hill Parks by means of the proposed boulevard. This accentuates the desirability of carrying forward improvements in Clifton Park from year to year, as opportunity presents. Clifton Park must, in time, become one of the most beautiful parks in the system.

The portion of land south of the B. & O. R. R. is surrounded by conditions which prevent the possibility of converting it into parking with any degree of success. The disposal of this strip of land, with the exception of a sufficient area for the Washington Street entrance, would be most desirable.

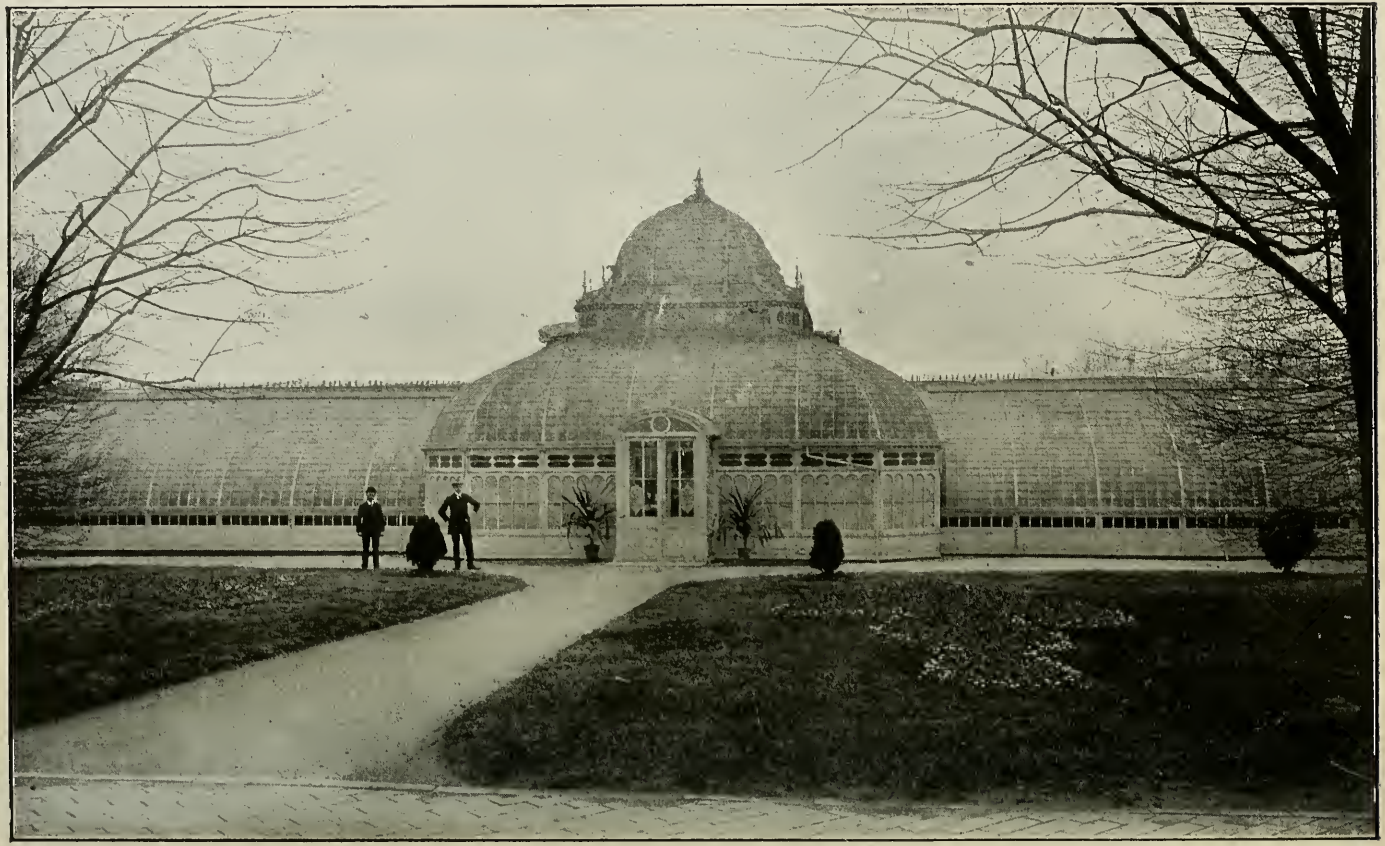
PATTERSON PARK.

(106 Acres. Acquired 1850. Cost $309,434.83.)

Gardening and Greenhouses.

During the year 1902, 375,000 bedding plants were raised in the Patterson Greenhouses, of which number 290,000 were distributed in the 427 beds in this district, and the balance planted in nurseries and rock borders. 427 trees and shrubs have been planted and 9,500 Chrysanthemum plants cultivated; 37 beds were filled with these plants. The conservatory, which was in bad condition, has been patched up suffi-

Entrance to Conservatory—Patterson Park.



Conservatory—Patterson Park.

ciently to make it last a little longer, as there were no funds to build another. In cleaning the bed of the old Boat Lake, 7,500 loads of soil were obtained, and were used to great advantage in the gardening department. A rock border was placed around the lake, using 1,200 loads of soil for filling in; this was planted in flowering plants, which made that part of the park very attractive, at the same time saving the expense of wooden railings, which require renewing every year.

Considerable repair work has been done to lawns and grass plats in the squares, but much remains to be done to put the lawns in first-class condition.

Several hundred trees were severely damaged by the great storm of July 13th, and heavy rain storms have injured steep grades and roadways. In repairing lawns and sodding in Squares, 16,050 square feet of sod were used.

Driveways and Paths.

These were kept in as good condition as was possible with material of an inferior grade received gratis, no broken stone or gravel having been purchased for road repairs.

Athletic Fields.

The athletic fields have been very popular and the base-ball diamonds kept in excellent condition during the past season. 317 baseball and 37 football permits have been issued for the several grounds. 4 new lawn tennis courts were laid off, and the number of athletes attracted to the park has so increased that the field house is found to be too small, and lockers, closets and shower baths are insufficient.

The skating on the two park lakes furnished enjoyment for thousands. On June 28th, the Municipal Athletic Games were held in Patterson Park, representatives from the various

athletic clubs participating, and 90 out of 125 contestants who entered took part in the games. Over 15,000 people were present at these games.

Children's Playgrounds.

The children's playgrounds have been a great success this year, and more apparatus is needed. The average attendance was 800 per day.

Miscellaneous.

The park is now a great thoroughfare and a marked increase of visitors compared with previous seasons is noticeable.

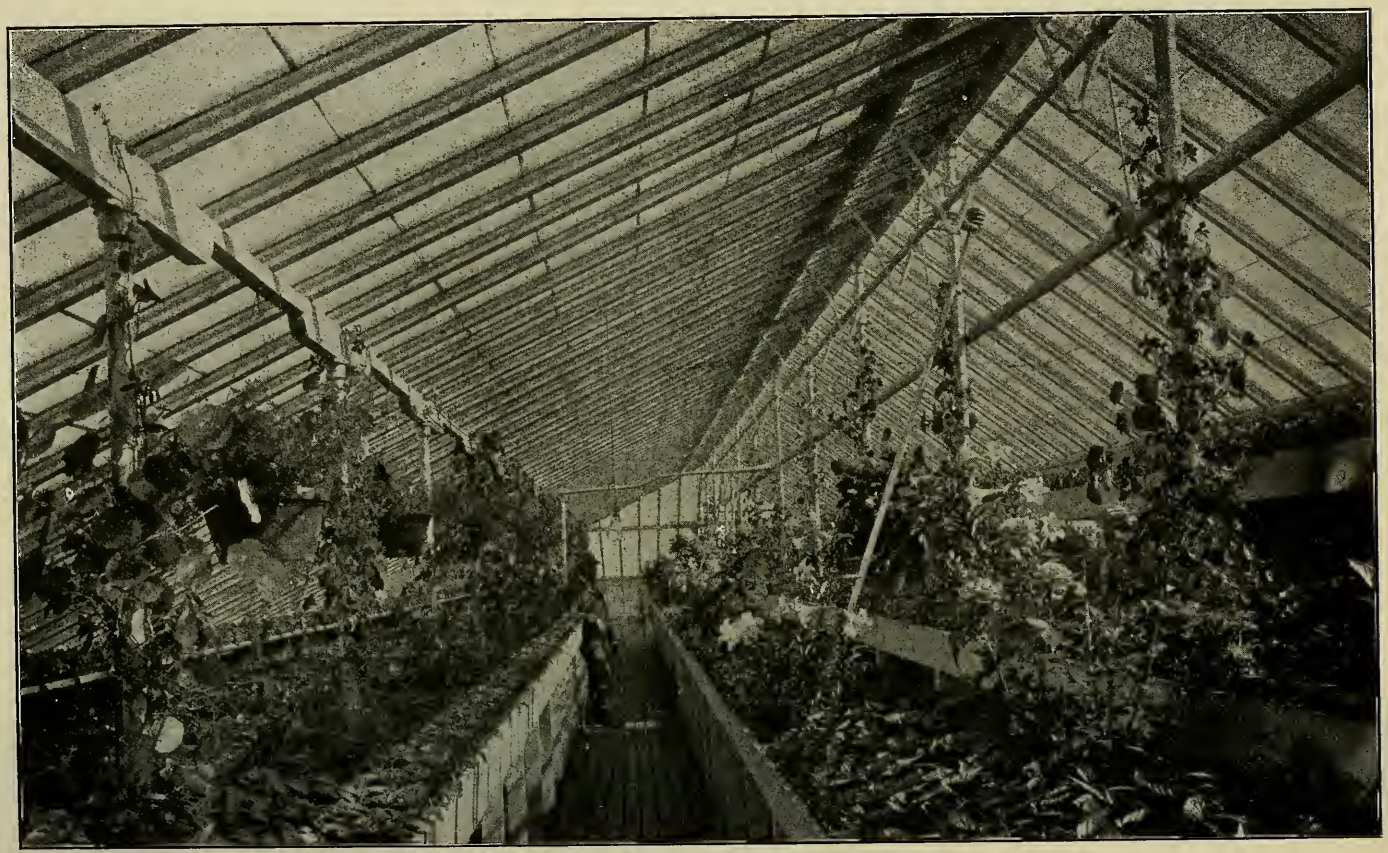
Additional arc lights are needed, and the closets and pavilions should be lighted at night. New street washers are needed in both the park and squares of this District, and the sanitary condition of the park closets should be improved.

CARROLL PARK.

(64.25 Acres. Acquired 1890. Cost $188,827.)

Gardening Department.

The great work in the Carroll District during the year 1902 was the entire reconstruction and overhauling of the bedding system. Many new beds were laid off, others were enlarged, and still others were revised and reshaped, and along this line there has been a great improvement effected in this district. Not only a greater number of plants, but plants of a far superior quality have been grown in our greenhouses in Carroll Park than we have ever had at our disposal, and these were used to great advantage throughout the district.



View of Propagating House, Carroll Park

It is estimated that two hundred thousand bedding plants were propagated successfully in the greenhouses in Carroll Park during the past year. Also 500 hardy shrubs were raised which will be in condition to plant in the district lawns this Spring.

New Extension.

The larger portion of our new extension, which was in rough shape in the beginning of the year 1902, has been shaped up and so much improved that it is hard to perceive now where the old portion of the park ends and the new extension begins.

Roads and drives have been constructed, trees planted where it was deemed advisable, and what is by far the greatest improvement, we have succeeded in raising a permanent surface of grass, the sod of which is equal to that in any portion of the older park, and what was a few years ago old brick yards, is now in reality a part of the pub'ic park, with a system of driveways and paths, trees for future shade and beautiful lawns.

The Older Portion.

In the older portion of the park new shrubbery and trees have been planted and new flower beds laid out. No new drives or walks have been constructed, but the old ones have been kept in their usual good condition.

The old mansion house during the past summer was repainted, repaired where necessary and generally renovated, adding to the appearance of this portion of the park.

Athletics.

The baseball field, although it needs improving, has afforded pleasure to young and old. This field was the scene of 176 games of baseball during the season of 1902. The

dressing room was repainted in the Spring, and new showers were installed, and the room made as convenient as possible for the players.

Children's Playgrounds.

Much interest having been aroused in the Children's Playgrounds in 1901, it was deemed necessary to increase the size of the playgrounds, and its capacity for growing vegetables of all kinds was almost doubled. The little farmers were quite successful, taking great interest and delight in the raising of vegetables.

We innovated in the summer of 1902 a miniature fair, under the auspices of the Children's Playground Association. The children sold the products of their little farms, as well as articles manufactured by them during the summer months, such as willow baskets, handkerchiefs, etc. This was a great success, the proceeds of which will be used by the Playground Association in the coming year for the purchase of apparatus, and it is contemplated holding an annual fair, to exhibit the results of the summer's work.

RIVERSIDE PARK.

(17.28 Acres. Acquired 1862. Cost $77,488.78.)

Roads and Walks.

Almost the entire surface of footways were re-surfaced during the year. The material used was obtained from the Moale's Point property, and the footways are now in first-class condition, five thousand and five hundred square yards having been re-surfaced. The driveways have been kept in repair, and one thousand two hundred square yards re-surfaced with gravel. The balance of the work consisted of ordinary repairs.

Drainage.

Cross-road surface drainage has been done away with, and the drainage is now carried off under ground through six-inch drains, for which purpose two hundred and eighty feet of six-inch pipe were used, and in addition ninety-seven feet of twelve-inch pipe. This work also required the building and rebuilding of eighteen brick inlets.

Painting.

The lower portion of both pavilions was painted, together with the benches, urns and closets.

Gardening.

The flower and foliage beds were carefully planted and cared for during the season, the fountain basin was well set with aquatic plants, and the beds of shrubbery in other parts of the park were kept in good condition and renewed when needed. About seven thousand square feet of sod were laid along borders and around benches.

The lawns have responded to the manure and lime treatment and the change in their appearance of a year ago is quite marked. This demonstrates the necessity of giving proper nourishment to our grass and trees if health and vigor are to be expected.

Buildings.

The building formerly used at Federal Hill Park as a tool house was removed and erected at Riverside Park, on the grounds set aside for the children's quarters. This house has been remodeled and is now quite an attractive and roomy building, having four hundred and thirty-six square feet of floor space.

Two additional stalls were erected in the stable, the same plan of construction being carried out that was used in building the other stalls.

Miscellaneous.

On Sunday, July 20th, an unusual storm occurred, which resulted in the total destruction of five magnificent trees and damaged twenty-seven others.

FEDERAL HILL PARK.

(8.25 Acres. Acquired 1879. Cost $91,135.46.)

Driveways.

The driveway has been kept in repair, three thousand one hundred and fifteen square yards having been re-surfaced where necessary.

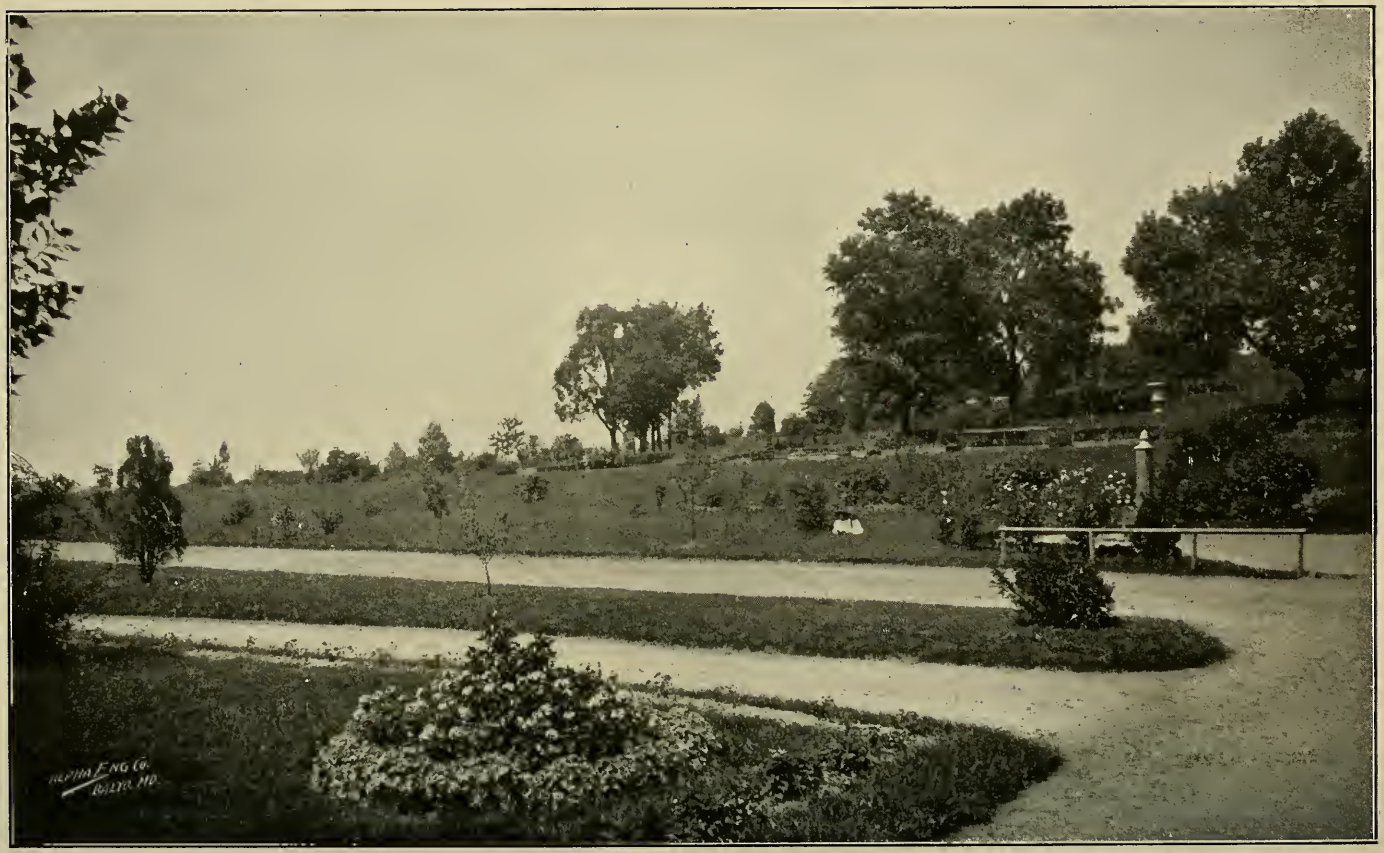
Footways.

These all being paved with asphalt blocks, are, with the exception of local settlements, always in good condition.

Gardening.

The beds on Warren Avenue were carefully planted, and although few in number, made a creditable display. All trees and shrubs have been cared for — cultivated, mulched and trimmed. Twenty-four trees were planted on the east middle terrace.

Considerable sodding was done during the Fall months, the great use made of this park during the summer months making it hard to maintain good turf. About eight hundred and sixty square yards of sod were laid during the season. In addition to lime and manure, more than one hundred loads of good loam were spread.



View in Carroll Park.

Miscellaneous.

The picket fencing on Hughes Street and the fencing along the back yards of the nine houses in the park was entirely rebuilt—the posts having decayed—amounting to three hundred and ninety-two feet.

Buildings.

The wind storm of July 20th damaged the Observatory to such an extent that it had to be taken down. All this work was done by our own laborers, at a cost of only ninety-seven dollars on the pay-roll account. This same storm destroyed three valuable trees, and injured fourteen others.

MOALE'S POINT PARK.

(6.50 Acres. Acquired 1902. Cost $25,000.)

This new park was also taken charge of the past season by the Park Board, and with what funds the Board had at its disposal the work of putting it in shape was begun on April 28th and continued until August 29th. On August 30th, these grounds were formally opened to the public with appropriate ceremonies under the auspices of the South Baltimore Business Men's Association, in conjunction with the young men of south Baltimore. Not less than seven thousand people were present.

The new park was very popular during the season, fully demonstrating the wisdom of its purchase.

About 7,160 cubic yards of earth were moved in order to do the rough grading, and get the field in shape for athletics. A further extension of the graded area is necessary, and as the rougher grading has been completed, this will not be a difficult matter.

LOCUST POINT PARK.

(8.75 Acres. Acquired 1902. Cost $25,000.)

Plans for the development of this Park were submitted to the Board by Superintendents Wessler and Flitton, and duly approved, but want of funds has prevented the Board from carrying them out. A watchman's box has been put up and a flag staff erected, but with the exception of some little grading, nothing else has been done.

WYMAN'S PARK.

(45 Acres. Acquired 1902. Donated.)

No steps have yet been taken to develop this site by the Park Board, owing to lack of funds.

GWYNN'S FALL PARK.

(29 Acres. Acquired 1902. Cost $15,987.80).

Want of funds has prevented any steps being taken for the development of this newly acquired park.

THE SQUARES.

		Acquired.	Cost.
Collington Square,	5.14 acres.	1880	$ 24,000 00
Bolton "	3.75 "	1891	103,433 00
Johnson "	2.58 "	1877	20,000 00
Mt. Royal Terraces,	2 "	1884	44,677 58
City Springs,	1.40 "	1818	15,000 00
Madison Square,	3.41 "	1853	30,000 00
Jackson "	.46 "	1844	(donated.)
Franklin "	2.50 "	1839	10,000 00
Union "	2.20 "	1847	(donated.)
Lafayette "	2.80 "	1859	15,000 00
Perkins Spring,	4.11 "	1873	34,200 00
Harlem Square,	7 "	1869	(donated.)

Silver Spring Drive—Druid Hill Park.

The Mall—Druid Hill Park.

All of the squares have been maintained and improved to the furtherest extent possible with the funds available. Trees have been trimmed out, the lawns very much improved, and the floral display kept up to a standard which only the growing of our own plants could make possible. In Harlem Square the improvement in the lawns must be specially noticed.

PARKED STREETS.

In the parked streets are included:

Mt. Vernon and Washington Place Squares, two each.
Eutaw Place Squares (eight).
Broadway Squares (seventeen).
Fulton Avenue Squares (fourteen).
Mt. Royal Squares (six).
Park Place Squares (two).
Taney Place Squares (two).
Wilkens Avenue Squares (seven).

These squares have been well kept and beautifully adorned with flower beds during the year.

GREEN SPRING AVENUE.

The saddling upon this Department, of the charge and maintenance of the highway extending from the north entrance to Druid Hill Park, through parts of Baltimore City and parts of Baltimore County, a distance of three miles or more, known as "Green Spring Avenue," placed upon the Park Board an additional burden which it had not the financial strength to bear.

This road, when deeded to the city, was in such bad condition as to be almost impassable in some places. It had been neglected and allowed to run down for upwards of thirty years, and its repair meant virtually the construction of a new road. Our Department was compelled to delay the

remedying of its condition because of lack of funds, until finally the matter was taken to court by the property owners along the highway, and the Board compelled to ask the Board of Finance Commissioners for a loan of $6,000.00, from the Contingent Fund.

To properly re-construct the road with this amount would have been impossible but for the public spirit of Mr. Henry Schwartz, who donated the "nigger head" stone on his premises near the corner of Green Spring and Belvidere avenues, and the like liberality of Mr. Walter King, who permitted the use of his property at that corner for the purpose of erecting a crusher and depositing the stone.

Superintendent Harry S. Sinclair, of Carroll Park, was directed to take charge of the re-construction, and in the early part of November a stone crusher was rented and erected, and the picking up and crushing of the stone was begun, additional laborers and teams being hired for the purpose. In the meantime, the grading and ditching was proceeded with and the roadway uniformly widened to forty feet, except in a few places, where a width of sixty feet was graded.

The work was carried along as rapidly as possible and is practically completed. It is only necessary now to put on the finishing surface, and what was at the beginning of the year a rough, stony and "rutty" road, will be a smooth, well graded driveway—a distance of three miles—through the beginnings of the natural grandeur of the Green Spring Valley.

PARK CONCERTS.

The Board, in the face of much difficulty, repeated its success of a year previous, in having public concerts in the parks during the summer months of 1902.

In preparing its estimates for 1902, in the fall of 1901, the Park Board inserted an item for music, which was cut out by the Board of Estimates. On May 27th, 1902, the

MANSION—CLIFTON PARK.

Park Board, by its President, went again before the Board of Estimates and, strengthened by the public demand for concerts during the season then near at hand, asked for $3,500.00 from the Contingent Fund, $3,150.00 of which was allowed.

Then came another obstacle to be surmounted. The requirement of the City Charter, that contracts involving $500.00 and over shall be awarded by the Board of Awards to the lowest responsible bidder, was so construed by the Law Department that music would have to be measured by the same standard as material or mechanical work, and the contract given to the lowest responsible bidder, regardless of artistic merit. With a "cheap" band thus a possibility, proposals were duly advertised for—the Board of Awards, with the view of excluding "bum bands," having inserted in the Park Board specifications a requirement that the successful bidder should furnish certificates that the members of his band were union musicians.

On July 9th the bids were opened, and another "snag" uncovered. The two rival bidders were members of rival musical unions—one "The Musical Union of Baltimore City," and the other "The Musicians' Protective Union." The former being the lower bidder, the latter by its counsel protested that union rates could not be paid at the figures submitted, and threatened legal proceedings. Thus matters were delayed until July 16th, when the Board of Awards gave the contract to the lower bidder on the opinion of the City Solicitor, with which opinion the rival bidders had agreed to abide.

Thus the concerts were finally assured, and on July 21st the series of eight weeks was begun, the first concert being given at Patterson Park. The following, with one or two special changes, was the schedule:

Monday and Saturday evenings, Patterson Park.
Tuesday evenings, (alternately), Riverside and Federal Hill.
Wednesday evenings, Carroll.
Thursday evenings, Druid Hill.
Sunday afternoons, Druid Hill.

The one Sunday concert given at the close of the 1901 season proved so popular, and so many petitions were received from music-lovers urging Sunday concerts, that the Park Board did not hesitate to make provision for the Sunday music. Not to interfere with either afternoon or evening services in the churches, the concert hour on Sundays was fixed from 5 to 7 P. M.

All the concerts of the season were very largely attended, and the programs approved by both press and public. So popular did the Sunday concerts become, that at the last one of the regular series—September 7th—25,000 people were present. This was followed by two extra Sunday concerts—one at Druid Hill on September 21 and the other at Patterson September 28. The latter concert was participated in by the United Singers of Baltimore, and proved a grand finale to the season.

New York has maintained a Sunday concert in Central Park for many years, and in some European cities there are as many as a dozen bands playing in the different parks on Sunday afternoons. The City of Baltimore has thus taken a forward step during the year just closed.

Trusting that our management will meet your approval, this report is

Respectfully submitted.

THOMAS R. CLENDINEN, *President.*
EDWARD J. GALLAGHER,
JOHN P. GALVIN,
EDWARD D. BOOZ,
R. BRENT WATERS,
Board of Park Commissioners.

Report of Secretary-Treasurer.

BALTIMORE, December 31, 1902.

To the Honorable, the Board of Park Commissioners of Baltimore, Maryland.

GENTLEMEN—I have the honor to submit herewith my report as Secretary-Treasurer of the Board of Park Commissioners for the year ending December 31, 1902.

Very respectfully,

J. V. KELLY,

Secretary-Treasurer.

Path to Prospect Hill—Druid Hill Park.

Receipts.

Street Railway Tax	$324,397 94
Rentals	2,116 00
Sales	709 07
Fines	212 00
Toll, Washington Monument	541 35
	$327,976 36

Appropriations.

Salaries, office	$ 3,024 00	
Expenses, office	1,447 00	
Salaries, parks and squares	164,862 48	
EXPENSES—PARKS AND SQUARES.		
Fixed charges $102,112 36	154,316 52	
Maintenance 52,204 16		
Total	$323,650 00	
Balance	4,326 36	
		$327,976 36

Balance from 1901.

Receipts for year over appropriation	$4,672 42
On 1901 accounts, closed	13 89
	$4,686 31

Disbursements.

SALARIES—OFFICE.

Appropriation	$3,024 00
Disbursements	3,024 00

EXPENSES—OFFICE.

Appropriation		$1,447 00
Disbursements	$1,099 75	
Balance	347 25	
		1,447 00

SALARIES—PARKS AND SQUARES.

Appropriation		$164,862 48
Disbursements—		
Druid Hill District	$62,870 21	
Clifton District	30,991 70	
Patterson District	32,219 93	
Carroll District	27,290 00	
Riverside District	11,231 85	
Total	$164,603 69	
Balance	258 79	
		164,862 48

EXPENSES—PARKS AND SQUARES.

Appropriation		$154,316 52
Disbursements—		
Druid Hill District	$38,090 41	
Clifton District	12,383 72	
Patterson District	13,927 85	
Carroll District	17,551 27	
Riverside District	3,621 66	
Music Loan (1901)	2,488 00	
Sinking Fund	27,619 13	
Interest on Loans	37,482 88	
Total	$153,164 92	
Balance	1,151 60	
		154,316 52

CONSTRUCTION OF LIGHTING PLANT—DRUID HILL PARK.

Balance from 1901		$7,540 21
Disbursements	$7,432 42	
Balance	107 79	
		7,540 21

MAINTENANCE OF LIGHTING PLANT—DRUID HILL PARK (Special.)

Balance from 1901		$3,966 61
Disbursements	$3,673 08	
Balance	293 53	
		3,966 61

MUSIC IN THE PARKS (1902.)

Loan from Contingent Fund		$3,150 00
Disbursements	$3,130 57	
Balance	19 43	
		3,150 00

REPAIRS—GREEN SPRING AVENUE.

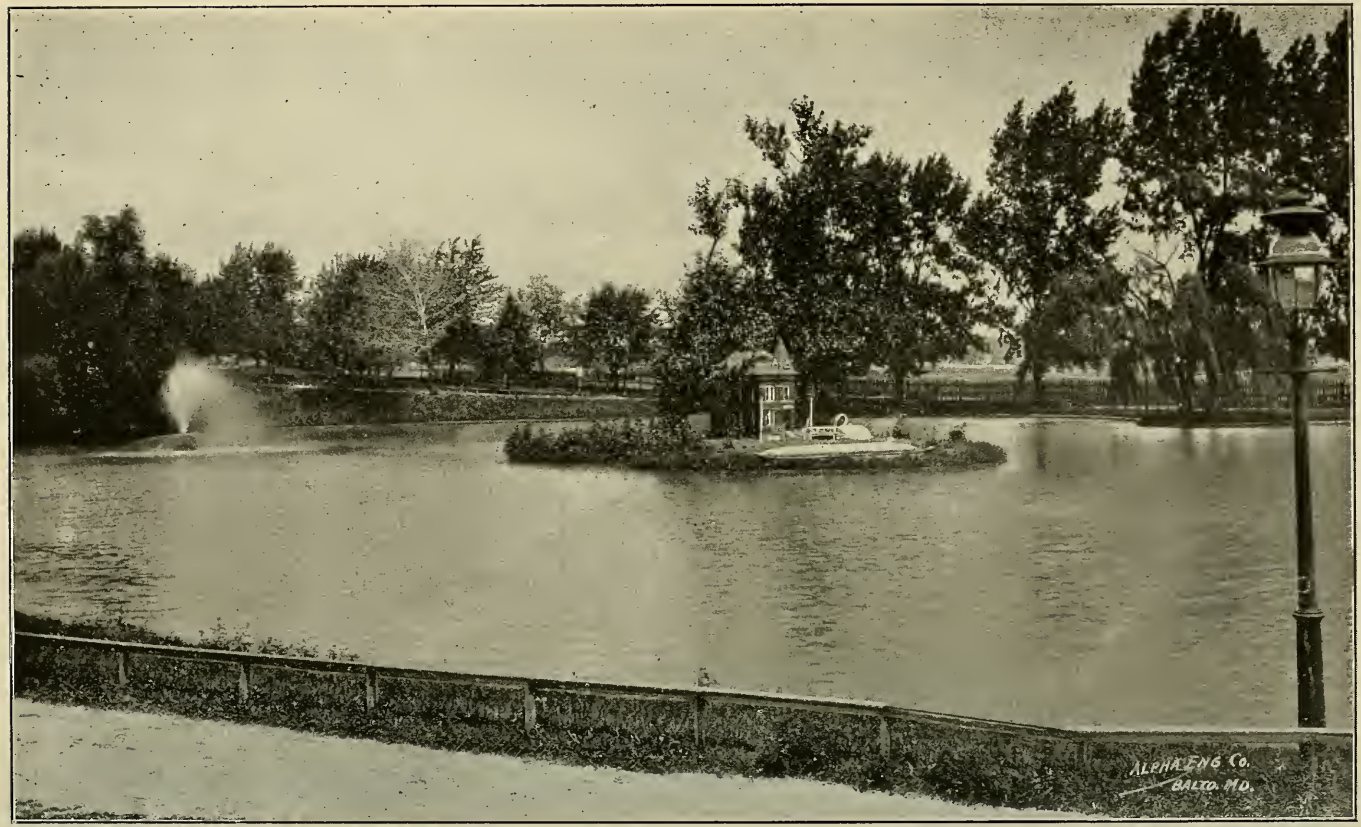
Loan from Contingent Fund		$6,000 00
Disbursements	$2,486 97	
Balance	3,513 03	
		6,000 00

Balances.

Balances from 1901		$4,686 31
Receipts 1902 over total appropriation		4,326 36
		$9,012 67
Balances on accounts forwarded from 1901—		
Construction of Lighting Plant, D. H. P.	$107 79	
Maintenance Lighting Plant	293 53	
		401 32
Appropriations 1902 over Disbursements—		
Expense—Office	347 25	
Expenses—Parks and Squares	1,151 60	
Salaries—Parks and Squares	258 79	
		1,757 64
Balances on Loans from Contingent Fund—		
Music in the Parks	19 43	
Repairing Green Spring avenue	3,513 03	
		3,532 46
Total balances		$14,704 09

Receipts—(In Detail.)

United Railways and Electric Company		$324,397 94
Toll Washington Monument		541 35
RENTALS—		
Druid Hill Park	$1,210 00	
Patterson Park	665 00	
Clifton Park	241 00	
		2,116 00
SALES—		
Druid Hill Park	$649 05	
Clifton Park	39 00	
Patterson Park	21 02	
		709 07
FINES—		
Druid Hill Park	$130 00	
Clifton Park	12 00	
Patterson Park	20 00	
Carroll Park	40 00	
Riverside Park	10 00	
		212 00
Total		$327,976 36



Lake in Patterson Park.

View of Conservatory—Patterson Park

Obligations incurred on account of "Salaries—Parks and Squares," and on account of "Expenses—Parks and Squares" during the year 1902, by the month:

1902.	Average Number of Employes.	Amount Paid to Employes.	Obligations for Materials.
January	272	$ 14,208 53	$ 6,402 83
February	256	10,723 81	3,029 34
March	264	9,801 14	2,953 75
April	280	11,425 54	3,332 55
May	318	15,974 75	2,841 71
June	347	14,091 20	3,416 40
July	370	15,340 64	3,419 85
August	344	18,513 33	3,062 33
September	287	12,282 98	3,363 15
October	301	15,052 01	2,375 63
November	308	12,872 70	4 542 97
December	302	14,317 06	3,939 08
Totals		$164,603 69	$42,679 59

TABLE "A."

SALARIES—PARKS AND SQUARES IN DETAIL.

Showing Payments made on account of "Salaries—Parks and Squares" for the year 1902. Itemized to show the distribution, on each of the several sub-accounts, among the five Park Districts.

Sub-Accounts under Item "Salaries—Parks and Squares." Position.	Appropriation.	Druid District.	Patterson District.	Clifton District.	Carroll District.	Riverside District.	Total.	Balances.	
								Dr.	Cr.
Superintendent, Druid Hill Park	$1,716 00	$1,749 00					$1,749 00	$33 00	
Superintendent, Patterson Park	1,560 00		$1,560 00				1,560 00		
Superintendent, Clifton Park	1,560 00			$1,560 00			1,560 00		
Superintendent, Carroll Park	1,300 00				$1,325 00		1,325 00	25 00	
Superintendent Riverside Park	950 04					$950 04	950 04		
Five Gardeners, charge green houses	4,680 00	1,834 00	912 00	912 00	1,640 00		5,298 00	618 00	
Twelve Assistant Gardeners	7,488 00	1,882 00	2,254 00	1,872 00	1,298 00		7,306 00		182 00
Keeper of Federal Hill	728 00					728 00	728 00		
Keeper Collington Square	728 00			728 00			728 00		
Keeper Johnston Square	728 00			728 00			728 00		
Keeper Mt. Royal Squares and Terraces	728 00			728 00			728 00		
Keeper Eutaw Place	624 00	624 00					624 00		
Keeper Park Place	624 00	636 00					636 00	12 00	
Keeper Fulton avenue	624 00	624 00					624 00		
Keeper Wilkens avenue	624 00				636 00		636 00	12 00	
Keeper Union Square	624 00				636 00		636 00	12 00	
Keeper Franklin Square	624 00				636 00		636 00	12 00	
Keeper Lafayette Square	624 00				636 00		636 00	12 00	
Keeper First Division Broadway	624 00		624 00				624 00		
Keeper Second Division Broadway	624 00								624 00
Keeper Jackson Square	624 00		624 00				624 00		
Keeper Eastern City Springs	624 00		624 00				624 00		
Keeper Madison Square	624 00		624 00				624 00		
Keeper Mt. Vernon Place	624 00			600 00			600 00		24 00
Keeper Taney Place Squares	520 00			520 00			520 00		
Sergeant of Police	676 00	599 68					599 68		76 32
Sixteen Day Officers	8,736 00	5,296 67	2,880 00	1,363 50	1,017 50	765 25	11,322 92	2,586 92	
Twenty-five Night Officers	13,650 00	5,935 01	1,161 00	2,481 00	1,134 83	819 00	11,530 84		2,119 16
Head Animal Keeper	728 00	700 00					700 00		28 00
Two Animal Keepers	1,092 00	1,178 50					1,178 50	86 50	
Two Shepherds	1,092 00	1,041 00					1,041 00		51 00
Three Carpenters	2,340 00	1,101 45	424 49	53 75	521 12	138 00	2,238 81		101 19
Two Painters	1,248 00			610 00	530 00		1,140 00		108 00
Bricklayers	936 00	260 77		17 50	168 00		446 27		489 73
Blacksmith	624 00	623 75	617 00				1,240 75	616 75	
Three Foremen of Laborers	1,872 00	2,054 00		644 00	652 00		3,350 00	1,478 00	
Laborers, including squares	77,480 00	24,280 24	17,876 73	17,272 09	14,896 89	7,258 05	81,584 00	4,104 00	
Two Stable Bosses	1,456 00	728 00		694 00	618 00		2,040 00	584 00	
Twenty-nine Teamsters	14,779 44	7,550 55			10 00		7,560 55		7,218 89
Two Engineers	1,560 00	1,015 00	48 00				1,063 00		497 00
Seven Green House Boys	2,184 00	1,854 14	546 25	161 00	244 50	121 00	2,926 89	742 89	
Three Toilet Keepers	1,365 00	772 50					772 50		592 50
Four Carters	1,404 00	78 75	1,430 46	6 00	665 16	452 51	2,632 88	1,228 88	
Charwomen	312 00	75 00	14 00	13 00	25 00		127 00		185 00
Boy at Washington Monument	130 00			27 86			27 86		102 14
Clerk at Druid Hill Park	200 00	184 25					184 25		15 75
Caretaker, Druid Hill Park	200 00	191 95					191 95		8 05
Cash balance							258 79	258 79	
Totals	$164,862 48	$62,870 21	$32,219 93	$30,991 70	$27,290 00	$11,231 85	$164,862 48	$12,422 73	$12,422 73

TABLE "B."

EXPENSES—PARKS AND SQUARES—IN DETAIL.

Showing payments made on account of "Expenses—Parks and Squares," for the year 1902, itemized to show the distribution, on each of the several sub-accounts, among the five Park Districts.

Sub-accounts under Item: "Expenses—Parks and Squares," in Ordinance of Estimates.	Appropriations.	Druid District.	Patterson District.	Clifton District.	Carroll District.	Riverside District.	Total Payments.	Balances.	
								Dr.	Cr.
Building repairs	$1,500 00	$ 323 35	$ 66 50	$ 20 34		$ 31 95	$ 442 14		$ 1,057 86
Electric lighting, excl. D. H. P.	9,192 83	3,249 24	3,090 40	784 46	3,683 77	441 96	11,249 83	2,057 00	
Maintenance Lighting Plant D. H. P.	2,487 81	2,890 58					2,890 58	42 77	
Feed, work animals	4,864 56	2,771 21	772 19	817 97	530 96	275 45	5,167 78	303 22	
Food, show animals	1,353 20	2,401 40					2,401 40	1,048 20	
Fuel	2,000 00	1,857 44	996 55	854 38	907 88	10 87	4,627 12	2,627 12	
Gas and oil lighting	4,679 76	793 42	425 38	3,736 21		804 00	5,759 01	1,079 25	
Gardening supplies	5,000 00	1,031 61	470 43	887 70	684 26	97 81	3,171 81		1,828 19
Hardware	600 00	172 47	38 23	25 55	32 87	23 50	292 62		307 38
Horse furniture and stable supplies	1,200 00	104 75	25 93	10 00	91 75	22 75	255 18		944 62
Horseshoeing	850 00	507 00	144 00	214 25	98 50	44 25	1,008 00	158 00	
Insurance	200 00	20 00					20 00		180 00
Lawn and agricultural machinery	1,200 00	38 25	81 75	199 85	76 40	65 80	462 05		737 95
Live stock—horses, animals, etc	500 00								500 00
Painters' supplies	1,300 00	26 57	131 91	54 43	131 30	47 95	392 16		907 84
Play-grounds and athletic fields	650 00	4 45	60 00	2 80			67 25		582 75
Rent of tool houses	200 00				36 00		36 00		164 00
Repairs, fountains, walks, etc	3,000 00	384 45	123 76	218 36	197 35	154 22	1,078 14		1,921 86
Rolling stock	500 00	234 60		75 00	172 50		482 10		17 90
Supplies—stone, sand, lime, etc	9,000 00	4,340 31	2,812 05	451 93	1,730 50	338 73	9,673 52	673 52	
Telephones	216 00	140 93	140 03	134 03	140 03	44 32	599 34	383 34	
Tools and implements	1,200 00	102 41	122 43	72 25	25 70	53 69	376 48		823 52
Veterinary services	150 00	16 00	2 50		37 00		55 50		94 50
Deficiency fund	34,180 00	16,679 97	4,423 81	3,787 21	9,011 50	1,164 41	35,066 90	886 90	
Music Loan, 1901	2,488 00						2,488 00		
Sinking Fund deferred from 1901	11,422 86						11,399 24		23 62
Sinking fund, 1902	16,000 00						16,219 89	219 89	
Interest on deferred Sinking Fund	534 00						215 27		318 73
Interest on Patterson Loan	8,000 00						8,000 00		
Interest on Clifton Loan	29,487 50						29,267 61		219 89
Cash balance							1,151 60	1,151 60	
Totals	$154,316 52	$38,090 41	$13,927 85	$12,383 72	$17,551 27	$3,621 66	$154,316 52	$10,630 81	$10,630 81

Of above payments:

Fixed charges accruing in 1901	$11,399 24	
Fund borrowed for Park Concerts in 1901	2,488 00	
Obligations contracted for maintenance and improvements in 1901	46,705 02	
		$60,592 26
Fixed charges accruing in 1902		53,702 77
Obligations contracted for maintenance in 1902		38,869 89
		$153,164 92
Cash balance		1,151 60
		$154,316 52

TABLE "C."

Showing expenses chargeable to the year 1902, irrespective of payments made during the year. Itemized to show the distribution on each of the several sub-accounts among the five Park Districts. This is the first Table ever prepared showing accurately the obligations accruing and entered into during a calendar year. Prior to the first of January, 1902, no accurate itemized account of obligations entered into from day to day was ever kept, and previous financial reports have covered only payments—outstanding debts at the end of a year being unknown heretofore.

Sub-accounts under Item: "Expenses—Parks and Squares," in Ordinance of Estimates.	Appropriation.	Druid District.	Patterson District.	Clifton District.	Carroll District.	Riverside District.	Totals.	Balances.	
								Dr.	Cr.
Building repairs	$1,500 00	$ 122 00	$ 66 50	$ 20 34		$ 25 50	$ 234 34		$1,265 66
Electric lighting excl., D. H. P.	9,192 83	2,381 73	3,114 22	783 91	$ 3,683 78	467 43	10,431 07	$1,238 24	
Maintenance Lighting Plant, D. H. P.	2,847 81	2,890 58					2,890 58	42 77	
Feed, work animals	4,864 56	2,652 21	705 56	817 97	483 10	257 00	4,915 84	51 28	
Food, show animals	1,353 20	2,354 40					2,354 40	1,001 20	
Fuel	2,000 00	1,378 35	971 81	303 96	835 64	13 20	3,502 96	1,502 96	
Gas and oil lighting	4,679 76	899 52	415 73	3,927 31		844 81	6,087 37	1,407 61	
Gardening supplies	5,000 00	1,029 11	564 43	1,131 59	690 66	97 81	3,513 60		1,486 40
Hardware	600 00	217 44	36 78	40 48	32 87	20 85	348 42		251 58
Horse furniture and stable supplies	1,200 00	83 51	28 03	13 45	76 75	22 75	224 49		975 51
Horseshoeing	850 00	550 00	132 00	180 00	112 00	44 25	1,018 25	168 25	
Insurance	200 00	20 00					20 00		180 00
Lawn and agricultural machinery	1,200 00	38 25	81 75	166 85	76 40	65 80	429 05		770 95
Live stock—horses, animals, etc	500 00								500 00
Painters' supplies	1,300 00	14 65	137 51	72 44	78 32	47 95	350 87		949 13
Playgrounds and athletic fields	650 00	4 45	60 00	2 80			67 25		582 75
Rent of toolhouses	200 00	44 00					44 00		156 00
Repairs fountains, walks, etc	3,000 00	428 70	158 12	205 01	196 65	154 22	1,142 70		1,857 30
Rolling stock	500 00	269 60		75 00	172 50		517 10	17 10	
Supplies—stone, sand, lime, etc	9,000 00	2,254 41	537 12	258 73	620 32	268 04	3,938 62		5,061 38
Telephones	216 00	40 52	40 52	40 52	40 52	40 52	202 60		13 40
Tools and implements	1,200 00	102 41	122 43	72 25	25 70	67 79	390 58		809 42
Veterinary services	150 00	16 00	2 50	37 00			55 50		94 50
Deficiency Fund	34,180 00								34,180 00
Music Loan, 1901	2,488 00								2,488 00
Sinking Fund, deferred from 1901	11,422 86								11,422 86
Sinking Fund, 1902	16,000 00						16,219 89	219 89	
Interest on deferred Sinking Fund	534 00						215 27		318 73
Interest on Patterson Loan	8,000 00						8,000 00		
Interest on Clifton Loan	29,487 50						30,800 00	1,312 50	
*Music in parks, 1902							3,130 57	3,130 57	
*Repairing Green Spring avenue							2,486 97	2,486 97	
Balance							50,784 23	50,784 23	
Totals	$154,316 52	$17,791 84	$7,175 01	$8,149 61	$7,125 21	$2,437 92	$154,316 52	$63,363 57	$63,363 57

Of above: Fixed charges accruing in 1902, $55,235.16, of which remained unpaid December 31, 1902 ..... $1,532 39

Obligations for maintenance contracted in 1902, $42,679.59, of which remained unpaid December 31, 1902 ..... 3,809 70

*Funds provided from Contingent Fund by Board of Estimates.

ANNUAL REPORT

OF THE

Inspector of Buildings

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ending December 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

DEPARTMENT OF BUILDINGS.

PERSONNEL.

Inspector of Buildings.
EDWARD D. PRESTON.

Assistant Inspector of Buildings.
GEO. R. BULLEN.

Inspector of District No. 1.
ROBT. H. CORNTHWAITE.

Inspector of District No. 2.
JOHN T. NEWNAM.

Inspector of District No. 3.
JAS. W. COLLINS.

Inspector of District No. 4.
JOS. R. DEGENHARDT.

Inspector of Furnaces.
JAS. W. MCCUEN.

Clerk.
ALBERT W. COOPER.

Assistant Clerk.
ELMER ALTREITH.

Permit Clerk.
HENRY ALLNUTT.

Electric Inspector.
WM. CLARKE.

Assistant Electric Inspector.
CLARENCE RANSOM.

Permit Clerk.
WM. J. MCDONNELL.

Draughtsman.
J. CLIFFORD SPEDDEN.

Extra Men.
J. S. BUSICK,
EDWARD W. GORMAN,
WM. M. CURRAN,
GEO. A. HOUCK,
WM. H. SCHULZ.

REPORT.

DEPARTMENT OF PUBLIC SAFETY—IMPROVEMENTS,
SUB-DEPARTMENT OFFICE INSPECTOR OF BUILDINGS,
CITY HALL.

BALTIMORE, January 2, 1903.

To the Honorable, the Mayor and City Council of Baltimore City:

GENTLEMEN: In a summary of the work of the year ending December 31, 1902, the record cannot be otherwise than gratifying, in showing, as it does, to what extent improvements have been made, many of which are a credit to the city for their architectural effect, and (I think it safe to say) all for the substantial manner of their construction.

The past year has been one in which more large buildings for business places have been erected or begun than any other during this term of office.

The record will show (as will be seen from the tables in this report) that—

Applications have been made for 2,081 various kinds of buildings and improvements, at a cost (as named on the applications) of..... $5,427,248 00

A perusal of these applications is convincing that in most of them the amounts named are insufficient to make the improvements specified ; and this, together with the fact that invariably more is done than originally contemplated, and also but seldom is the elevator, office fixtures and other such necessities included in an application for building, makes it safe to add at least 20 per cent. as a minimum of outside improvements applied for in this office. The amount of this would be..... 1,085,449 60

Thus making the minimum cost of improvements applied for..... $6,512,697 60

This amount would undoubtedly be increased, but for a too common erroneous impression that the smaller the amount named will keep down the taxable basis of the property. This prevents correct compiling of such statistics as would be of interest to the city. An additional reason that a correct amount should be named, the U. S. Government Bureau gathers all such showings in their report throughout the country, and a comparison of the advance of cities is made therefrom. Heretofore such reports have been made from assessable amounts and not from acutual costs of improvements. In addition to the applications above noted, 10,242 permits have been issued direct from this office for sheds, frame extensions, porches and other work, the approximate value of which is..... 1,968,391 00

Or a total of all embraced under the applications and permits of this office of.. $8,481,088 60

This is not to be taken as the full amount of mechanical industry under the supervision of this Department. There is a great amount of other work for renewing or renovating, for which permits are not required, and which, if it could be summed up, would increase the amount of building industry for 1902 greatly in excess of the above figures; and the citizens of Baltimore could not but look with pleasure upon the year as one of advance in the building line.

While the private citizens and corporations have been so extensively engaged in improvements, the municipality has not been lagging behind in needed improvements that come under this office, as the reports will show. (See tables.)

2 new engine houses completed,
1 new engine house being erected,
2 new engine houses provided for,
6 engine houses rebuilt,
5 new school houses being erected,
1 new school addition completed,
2 new school houses provided for,
13 additions and improvements to schools completed,
15 new sanitary systems put in the old buildings and all of the other 192 properties under the supervision of this Department more or less repaired.

Such a great amount of city improvements has not taken place for some years.

Although some of this work of new improvements has been completed and is now occupied, the other might have been further advanced or done had it not been for delays that might have been avoided; such delays being caused by insufficient appropriations for such work as was contemplated, and in consequence thereof much time was wasted in waiting for additional amounts.

This appears to have been a drawback to the improvements of the city, and it would be better to decide what would be needed in the proposed building or improvement first, and then appropriate money enough to erect it. It is

safe to say that other than this course is the cause of having so many of our city buildings anything else than what they should be, an adornment of the city, and comfortable and healthful to the occupants.

While the office has been busy as a Sub-Department of Public Improvements, as a Department of the Public Safety it has been called upon to a greater extent than any former year.

Some very serious developments have opened up with some property, but, it is gratifying to note, without the loss of life.

There are numbers of places that should be removed or rebuilt, but persons are holding back for the reason that it has been standing so long in such manner, that they believe no danger exists; the suddenness with which a collapse comes, as has been clearly shown recently in this city, should be a warning in all such cases.

Another requirement of this office is furnace inspection; and it is very noticeable how the greater number of heating men are guarding against such work as was in use some time back, and endeavoring to place safeguards about heating apparatus. While many are endeavoring to place this kind of work at its highest standard, some are reckless and trying to elude inspection, and wherever this class of men do furnace work, it is almost invariably the case that an inspection of their work reveals a most dangerous and threatening condition, and such as is a menace to the lives of occupants of buildings where their work is done.

This class of heating men have been great cause of trouble during the last year, and while it has compelled me to proceed against them, the office has not been sustained as it should be by those whose duty it is to impose penalties.

Electrical supervision is also another branch of the Public Safety under the supervision of this office. Although this has been in practical operation only about two-thirds of the year, the work already accomplished attests that there was no mistake made in having it under municipal control.

The inspections thus far made have revealed worse conditions than were known or suspected, and while considerable time will be necessary to rectify all bad conditions now existing, the electricians of the office will endeavor to see to it that work hereafter installed will only be of such character as will insure safety of persons and property. This department is indebted to the United Electric Company for its aid in refusing to cut current in where there is no certificate.

The reluctance with which many persons provide fire escapes to places where the law requires them, is most deplorable. Notwithstanding the almost daily warnings by calamities in other places, a number of places in this city are indifferent to the protection due their guests and employes.

But few persons seem to realize that a panic can arise from smoke from burning furniture, or escaping steam from disarranged or broken steam apparatus, thus making as much necessity for escape as though the building itself were burning.

The Fire Department and also the Police Department are rendering valuable aid in making known places where escapes are needed.

Some additional legislation is necessary in the interest of the Public Safety regarding

ELEVATORS.

A constant menace to the public safety is the improper uses made of, the incompetent handling, manner of construction, and the continued running while not in perfect condition, of elevators in this city. When it is considered to what extent these conveyances are used by the public and the danger to which those using them are exposed from either or all of the above causes, it is plainly evident that stringent laws should be enacted to protect the unsuspecting user from accident.

Everyone throwing his or her business place open to the public and inviting patronage, makes their place a public thoroughfare, and should be required to see to the protection of patrons, as much as the city is required to protect persons on its streets.

Any investigation that might be made would reveal a condition not generally known, such as the using of freight waiters to carry passengers, or passenger cars to carry people and freight simultaneously; also that conveyances of this kind were being run by mere children, or if by older persons, by such as know but little more, save the mere turning of the wheel, or pulling the rope to start and stop its motion; also an almost universal plan of having the stairways around the elevators, without being properly separated; also a great number of elevators in use with defective machinery or stranded ropes.

There seems to be an awakening up upon the part of some persons as to these conditions, and the necessity for such laws as would protect persons using them.

Freight and passenger elevators should be used for no other purpose than for that which it is especially arranged, and no person should be allowed to operate an elevator who is not conversant with its machinery, or had instructions under some competent person long enough to become thoroughly familiar with its operation. Every waiter should be provided with proper safety device that should be almost daily examined to know if effective, and wherever a car is used for passengers, the locker should be used for holding it at the floor or platform until the enclosure door is entirely closed before it can be moved. Wherever there is a combination of stairs and elevator, the owner should be compelled to separate them by brick wall or non-combustible partition. Any elevator that has defective machinery or gearing, is nothing less than a death-trap and should be prevented from use.

These are but some reasons why Baltimore should have elevator regulations similar to all the principal cities of the country; the more the question is considered, the more convincing does it become as to this necessity, and I ask due consideration of it.

FOUNDATIONS.

I am compelled to ask that something be done by which the reckless manner of filling low ground and hollow places in and about the city may be done away with. The great difficulty in many places of getting foundations for new buildings, and the many cases of condemnation of houses now standing due to improper filling, demand this.

In some of the places where dangerous walls have been removed, owners who have bought the property have been compelled in rebuilding to go through old bushes, excelsior, and various kinds of decaying matter to obtain solid foundations, and this to the great danger of adjoining premises. And not only is the stability of any house on such filling threatened, but the great quantity of decaying vegetable matter that has shown up, with its terrible stench, cannot fail to cause disease and sickness. It is seen in a number of places at present that such filling is still going on, and prompt measures should be taken to prevent a repetition of defective foundation, and later on condemnation of houses. Quite often has this office been compelled to make builders go to greater depths than they would have done had proper fillings been made.

FLOORS OF BUSINESS PLACES.

This department has been compelled to send notices condemning property as unsafe on account of overloading floors where in some cases the timbers have been at breaking strain.

While the law requires architects to post safe weights for floors in the new houses they erect, there are many places built previous to the enactment of such law that are being constantly loaded beyond their capacity. It would be well if a requirement would be made that all places where goods are stored or kept should be posted in some conspicuous place in each store, and in such manner as not to be destroyed, the maximum safe load that such floor or house will carry on the floor, either distributed or concentrated.

In connection with floors, many persons are utilizing stairways as storage places, leaving space enough for only one person to pass up and down. This is most dangerous to exit in cases of fire or panic, as well as being unsafe to occupants or patrons.

OVERCROWDING IN PUBLIC ASSEMBLAGE.

In addition to the present laws for blocking aisles with stools, chairs, etc., the law should be amended to compel proprietors of public places to prevent the aisles of their buildings from being crowded during service or performance of any kind. The consequences that are liable to result from such crowding may be most serious, and are sufficient when properly considered to demand most effective measures.

LIVERY STABLES.

The general tendency seems to be to arrange the stabling of horses at livery in as close quarters as possible, with but little consideration for hasty exit, if required. But few of the public stables in this city are safe as to this, and a law should be enacted requiring ample means of escape.

BUILDERS' PRIVILEGES.

An ordinance has been before the Council, and no action yet taken, on the occupancy of the sidewalks and streets during building operations. This is a most important matter

and should be acted on as quickly as possible. A number of accidents have occurred where piles of building materials were in too close proximity to car tracks. Not only is there danger from this cause, but the reckless manner of storing materials, and the extreme height to which it is so often piled, are a menace to safety. It is hoped, therefore, that this ordinance will be shortly adopted.

PRIVATE STREETS.

The frequent constructions projecting beyond the building lines on other than city streets is a source of much inconvenience, and often detrimental to the safety of the public using them ; and as the city laws are not applicable to such conditions on a private street, and the claim is sometimes made for privileges more than is allowed on public streets, it would be well if an ordinance could be enacted that no private street could be opened without all various parts of the improvements should be in accordance with laws and regulations governing public thoroughfares.

FIRE LINE.

A very important measure for the interest of the city is the establishment of a boundary line for brick and frame houses.

This question has been agitated before and allowed to pass without any definite action. Such delay is against the interest of the city, and the longer it is delayed the more will a character of buildings be pursued that will be detrimental to city interests.

It is not intended to prohibit the erection of frame cottages in all the annex, but restrict frame buildings in the thickly populated portions, and sanction the building of frame structures in other parts, provided they are separated from each other. The adoption of some such plan would not only be in the interest of public safety, but would also

avoid many difficulties and questions arising almost daily in this Department.

It is earnestly hoped that it will be considered and settled as soon as possible.

BUILDING LAWS.

The advanced methods of construction over that at the time of framing the present law demand a complete revision of the building requirements. While the city is not so compact for want of ground as to compel the erection of extremely high buildings, there are some few quite elevated and a number of others that are above the regulations as provided for in our law, and for which the ordinance has no provisions as to construction. On account of this architects and builders, as well as this office, are considerably hampered, and a great deal of time required frequently, inquiring into what can be allowed without conflict with law. As our law is now, the modern steel and concrete structures could not be built in this city, and the greater amount of improvements would cease, and only such building can be done as would grace a very ordinary town of by-gone years. This office has been compelled to use some discretion in reference to such construction, but it is not right to put either this office or the people who desire such improvements in such position as that the one feels he is acting without authority, or the other that unjust impediments are thrown in his way.

Not only is the revision necessary on account of such improvements, but also on account of frame houses. The law as it is says the Inspector shall have supervision over frame buildings in the annex, and what supervision means without anything in the building regulations is hard to say.

I would therefore suggest that a commission consisting of an engineer, an architect, two builders, and the Inspector of Buildings be appointed to draft suitable laws as would meet the wants of the city.

CITY PROPERTY REPAIRS.

All the city property has had some repairing.

CITY HALL.

The inside painting commenced under contract made last year has been completed, and other repairs made, including the boilers damaged by turning off valves. In addition to the repairs made to the tile floors, considerable more will yet have to be done, as the tiling in all the corridors is becoming loose and quite a number of people have fallen.

The part of the building known as the annex, and occupied by the City Engineer, is in need of remodeling. This could be arranged on a plan similar to the story immediately below it, and make a suite of offices that are much needed.

COURT HOUSE.

The changing the water power for the elevator at the City Hall to electric, which power is supplied from the Court House plant, has necessitated additional switch board. The boiler of plant has also required considerable repair, amounting to about $1,000.00. This great amount of repairs should act as a warning that there is liability of a break down, and should it occur there is no reserve to fall back on. This would probably so deprive the building of heat and light as to interfere with the Courts and other business transacted there.

A serious difficulty exists for want of room to put in one or two additional batteries of boilers; to overcome this it would be better to construct a building and plant outside of the courthouse, and conduct the heat and currents by conduits; this would not only guard against any condition as spoken of, but would also be a relief to the courts from the intense heat, vibration of machinery, and other annoyances that are now complained of.

BUILDINGS USED BY SCHOOL BOARD.

There was appropriated for improvements and sanitary work at these buildings the sum of.....$41,950 00

Improvements being made as follows:

Training school for teachers	$2,126 35	
Enlargement of chemical laboratory at Polytechnic Institute	1,246 30	
Additional story on workshop at Colored Polytechnic	3,548 75	
Teachers' room at No. 4 School	200 00	
Areas, sewers and floors at No. 23 School	3,370 00	
Metal ceilings at No. 32 School	455 00	
Frame addition at No. 57 School	1,693 48	
Partitions at No. 63 School	694 93	
Metal ceilings at No. 78 School	1,092 00	
Metal ceilings at No. 105 School	290 00	
Addition to Administration Building	2,395 07	
Partitions at No. 1 School	700 00	
Partitions at No. 73 School	403 70	
		$18,215 58

There were also improvements made in the sanitary work at the following buildings:

No. 4 School	$1,474 72	
No. 6 "	1,468 63	
No. 12 "	150 00	
No. 26 "	1,857 89	
No. 27 "	2,695 48	
No. 29 "	1,421 77	
No. 34 "	1,207 21	
No. 43 "	150 00	
No. 77 "	2,075 49	
No. 80 "	2,400 00	
No. 96 "	2,872 12	
No. 99 "	1,943 00	
No. 105 "	1,856 86	
No. 112 "	226 25	
No. 113 "	1,935 00	
		$23,734 42
		$41,950 00

Considerable painting has been done to the school buildings. It is the aim of this office to keep these buildings protected with paint, and in order that this may be properly done without too much outlay at one time, the inside of a school is done one year, and the outside another year.

The schools painted this year, either inside or out, were Nos. 1, 3, 5, 6, 7, 9, 11, 16, 17, 20, 24, 32, 35, 42, 43, 46, 47, 48, 51, 52, 60, 66, 70, 75, 76, 78, 82, 91, 92, 95, 105, 108, 110, at a cost of $13,576.75.

General repairs to floors, stairs, locks, fencing, paving, roofing, etc., were made to Nos. 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 60, branch, 64, 65, 66, 67, 68, 70, 71, 72, 73, 75, 76, 78, 79, 80, 81, 82, 91, 92, 93, 94, 95, 97, 99, 100, 101, 102, 103, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 77, at a cost of $57,733.88.

The painting and general repairs were done out of the appropriations for repairs to city property consolidated; the separate amounts expended on each school building will be found in the annexed table.

There are some city buildings now being used that are unfit for school purposes, and should be replaced with new ones, or improvements made in them to better their condition; and but few of the rented buildings would be used if the School Board could do better.

FIRE DEPARTMENT HOUSES.

During the year the following houses have been rebuilt:

No. 3 Engine House	$ 6,886 14	
No. 8 " "	3,006 85	
No. 12 " "	2,688 43	
No. 14 " "	10,665 08	
No. 18 " "	7,342 35	
No. 5 Chemical	1,667 03	
		$32,255 88

And those repaired were:

Engine Houses Nos.	1	Engine Houses Nos.	11
	2		13
	4		15
	5		16
	6		17
	7		19
	9		20
	10		21
H. & L. Cos. Nos.	1	Chemical Nos.	1
	2		2
	3		4
	4		5
	5		
	6		
	10		
	11		
At a cost of			16,902 44
			$49,158 32

MARKETS.

Each of the eleven markets have had some repairs and painting. Their general structural condition is only fair, but all need painting. There is much abuse of the markets by recklessness, especially by those having stalls throwing awnings and other parts of their structures on the roofs, and also by the apparent delight some boys take in seeing how many stones or shells they can throw on some of the market houses. Amounts spent on markets in total were $4,744.01.

STATEMENTS.

STATEMENT OF APPROPRIATIONS AND DISBURSEMENTS ABOUT THE OLD CITY PROPERTY.

Appropriated for repairs to city property, consolidated	$136,347 00	Paid out for City Hall and Annex	$ 8,883 88
Sanitary and other improvements	41,950 00	Court House	3,613 22
Emptying cesspools	600 00	City Jail	2,293 92
Livery and transportation	750 00	Improvements School Board and buildings	18,215 58
Incidentals	500 00	Sanitary work	23,734 42
Received special through the Board of Estimates for boilers at City Hall	1,211 00	Painting school buildings	13,576 75
Carried forward from 1901 to meet contracts	2,322 25	Repairs to floors, roofs, paving, etc	57,733 88
		Rebuilding six engine houses	32,255 88
		Repairs to twenty-eight engine and truck houses	16,902 44
		Repairs to markets	4,744 01
		other property	476 27
		Paid livery and transportation	750 00
		incidentals	384 83
		Balance	115 17
	$183,680 25		$183,680 25

SALARY ACCOUNT.

Appropriation	$18,700 00	Paid out:	
From contingency fund to operate the Electric Ordinance	2,666 67	Inspector of Buildings	$ 3,000 00
		Assistant Inspector of Buildings	1,200 00
		Four Assistants	4,800 00
		One Clerk	1,000 00
		Inspector of Furnaces	1,200 00
		Two Electric Inspectors	1,870 78
		Extra help	7,910 38
			$20,981 16
		Balance on hand	385 51
	$21,366 67		$21,366 67

NEW IMPROVEMENTS AS PROVIDED FOR IN ORDINANCE OF ESTIMATES 1902.

	Appropriation.	Paid Out.	Balance.
Building Chestnut and 4th avs	$40,000 00	$23,175 04	$16,824 96
Addition to No. 54 school, 25th street	10,000 00	9,138 25	861,75
Lot and building, East Baltimore	40,000 00	34,315 57	5,684 43
Lot and building, South Baltimore	40,000 00	24,707 83	15,292 17
Lot and building, Engine House	35,000 00	25,777 93	9,222 07
Lot and building, Walbrook avenue	50,000 00	31,802 12	18,197 88
Lot and building, Infectious Hospital	25,000 00	191 50	24,808 50
Lot and building, 22nd and Cromwell streets	50,000 00	41,272 36	8,727 64
Lot and building, Engine House, Waverly	18,000 00	13,974 49	4,025 51
Heating No. 11 Truck House	1,200 00	1,154 00	46 00
	$309,200 00	$205,509 09	$103,690 91

STATEMENT

Showing Applications and Permits, and Values of Improvements.

In the year 1902 applications were made for 2,081 buildings and improvements, of which 1,662 brick and 1 frame were in old city limits; 311 brick and 107 frame were in the Annex. Of which there were:

17 churches at value named in applications	$ 467,102 00	
6 banks	277,000 00	
7 hotels and apartment houses	1,605,000 00	
50 stores, warehouses, etc	707,435 00	
1,491 dwellings	2,099,372 00	
510 additional improvements	271,339 00	
	$5,427,248 00	
Add 20 per cent. for reasons previously given	1,085,449 60	
		$6,512,697 60

Permits were also issued for:

731 sheds at cost, approximating	$ 73,110 00	
913 frame extensions and porches, approximating	168,700 00	
70 frame bathrooms, approximating	17,500 00	
5 rear awnings, "	200 00	
583 franchise privileges, approximating	13,381 00	
5,026 repairs to walls, sheds, etc., approximating	1,004,800 00	
1,387 electric wiring, approximating	174,500 00	
66 hot-water apparatus, approximating	33,000 00	
1,228 hot-air furnaces, approximating	184,200 00	
77 steam-heating apparatus, approximating	77,000 00	
96 steam-power boilers and engines, approximating	192,000 00	
55 gas-power engines, approximating	27,500 00	
5 gasoline-power engines, approximating	2,500 00	
		$1,968,391 00

1,194 electric certificates were issued.

Amount carried forward $8,481,088 60

Amount brought forward			$8,481,088 60
In addition to the above work has been done or commenced by the city as follows in 1902:			
No. 22 Fire Engine House	Ground costing.	$ 3,000 00	
	Building "	20,311 00	
No. 7 Truck House	Ground "	1,333 33	
	Building "	17,620 00	
Addition to No. 54 School, Twenty-fifth street	Building "	17,250 00	
Chestnut and 4th avenues, building	"	44,969 42	
Walbrook avenue and Smallwood street	Ground "	5,000 00	
	Building "	64,028 10	
Twenty-second and Cromwell streets	Ground "	7,000 00	
	Building "	67,100 05	
Lakewood avenue and Orleans street	Ground "	9,166 66	
	Building "	58,790 40	
Johnson and Heath streets	Ground "	10,000 00	
	Building "	58,855 00	
No. 23 Engine House, Saratoga street	Ground "	23,500 00	
	Building "	20,295 00	
			428,218 96
Also the rebuilding and repairing of engine houses, and repairs to schools, City Hall, Courthouse and other city buildings			137,558 00
Improvements and sanitary work in schools			41,950 00
Total work in connection with this office			$9,088,815 56

STATEMENT

Showing the Work Done or Arranged for as a Comparison of Years 1900–1901–1902,

1900.		
Balance of former appropriation out of which ground was bought and house erected for No. 11 Truck Company	$ 24,295 32	
Balance from fund at City College, out of which entire yard was paved with asphalt blocks, wire guards placed in basement windows, and other improvements made	2,304 18	
Remodel Administration building, fit up Teachers' Training school, repairs to schools and fire engine houses, and repairing quarantine buildings, also 3 sanitary systems in 3 school buildings, costing	$120,588 00	
		$147,187 50
1901		
Repairs to city property, including increase of heating plant at City Hall, partitions at Court House, improvements at 11 school buildings, sanitary systems put in 16 schools, rebuilding and remodeling 7 fire engine houses, and cement pavements in 4 market houses		167,603 00
1902.		
Completing 2 new fire engine houses	$ 42,264 33	
Completing 1 addition to school	17,250 00	
Commencing 5 school buildings to cost	324,909 63	
Commencing 1 fire engine house	43,795 00	
Repairs to city property	137,558 00	
Improvements and sanitary arrangements	41,950 00	
		$607,726 96
		$922,517 46

AMOUNT APPROPRIATED FOR 1903.

Repairs to city property consolidated	$132,567 00
Sanitary improvements	20,600 00
Improvements to schoolhouses	20,000 00
Laboratory City Hall	1,000 00
Substituting furnaces for stoves	18,800 00
Emptying cesspools	500 00
Shed Bowly's Wharf	2,034 00
Engine House, McCulloh and Gold streets	30,000 00
" " N. E. Section	20,000 00
School House, Saratoga and Mount streets	50,000 00
" " Hollins street	45,000 00
	$340,501 00

Applications and Permits—Comparative Statement for Three Years.

	1902.		1901.		1900.	
	No.	Value.	No.	Value.	No.	Value Not Given.
Churches	17	$ 560,522 40	7	$ 35,400 00	10	.....
Banks	6	332,400 00	3	154,800 00	.....	.....
Hotel and apartment houses	7	1,926,000 00	4	56,400 00	.....	.....
Stores, warehouses, etc	50	848,922 00	86	732,711 20	93	.....
Dwellings	1,491	2,519,246 40	1,271	1,802,377 20	1,250	.....
Additional improvements	510	325,606 80	182	101,389 20	553	.....
Hospitals	.....	.....	8	134,280 00	.....	.....
Sheds	731	73,110 00	602	60,200 00	571	.....
Frame extensions and perches	913	168,700 00	869	130,350 00	1,060	.....
Bathrooms	70	17,500 00	84	21,000 00	129	.....
Rear awnings	5	200 00	10	300 00	19	.....
Franchise privileges	583	13,381 00	432	5,538 54	314	.....
Repairs to walls, sheds, etc	5,026	1,004,800 00	4,364	872,800 00	2,403	.....
Electric wiring	1,387	17,400 00	.....	.....	.....	.....
Hot water apparatus	66	33,000 00	44	22,200 00	.....	.....
Hot air furnaces	1,228	184,200 00	1,238	185,700 00	1,348	.....
Steam heating apparatus	77	77,000 00	91	91,000 00	.....	.....
Steam power boilers and engines	96	192,000 00	64	128,000 00	84	.....
Gas power engines	55	27,500 00	.....	.....	.....	.....
Gasoline power engines	5	2,500 00	25	125,000 00	.....	.....
Electric motors	57	17,100 00	.....	.....	.....	.....
	12,380	$8,341,088 60	9,384	$4,659,446 14	7,834	.....

STATEMENT

Showing Condemnation and Notices Sent for the Public Safety.

	1902	*1901*	*1900*
Hotels	3	....	....
Churches	5	....	....
Schools	3	....	....
Business places	36	....	....
Dwellings and stables	248	201	118
Walls	663	405	372
Chimneys	137	28	103
Violations of Building Laws	300	410	187
Repairs to rainspouts, areas, floors, etc	525	603	447
Fire escapes	54	....	....
Furnaces	75	....	....
Electric wiring	114	....	....
Dangerous electric work	82	....	....
	2,245	1,647	1,227

There have also been 516 buildings examined for means of exit; also 8 buildings torn down by the city in the interest of public safety.

STATEMENT OF INCOME FOR PERMITS ISSUED.

	1902.	1901.	1900.
Frame sheds	$3,393 75	$3,058 75	$4,360 25
Rear bay windows	436 90	658 00	177 00
Frame extensions, porches, etc	1,276 48	747 75	2,041 75
Bath rooms	186 90	164 00	258 00
Rear awnings	20 00	32 00	76 00
Advertising, sheds, boilers, etc	1,022 40	603 00	1,205 95
Permits issued by order of the Board of Estimates	13,240 66	5,538 54	17,435 03
Total	$19,577 09	$10,802 04	$25,554 98

List of Property Under the Supervision of this Department.

City Hall	1
Court House	1
City Hall Annex	1
City Jail	3
Administration Building (School Board)	1
Baltimore City College	1
Eastern Female High School	1
Western Female High School	1
Polytechnic Institute	1
Colored High and Training School	1
School Buildings (owned by the city)	104
School Buildings (rented by the city)	27
Engine Houses (Fire Department)	22
Truck Houses (Fire Department)	8
Chemical Engine Companies (Fire Department)	2
Market Houses	11
Public Halls	4
Quarantine Stations	5
City Morgue	1
Belair Lot (shed)	1
City Yard (enclosure)	1
Old Southern Police Station	1
Potter's Field	1
City Dock	1
Engine House under construction	1
Truck House under construction	1
School Houses under construction	5
	208

TABLE

Showing Expenditures on Various Properties.

City Hall			$8,800 46	
City Hall Annex			83 42	
New Court House			3,613 22	
City Jail			2,293 92	
				$14,791 02
Baltimore City College			949 11	
Eastern Female High School			789 28	
Western Female High School			2,340 58	
Administration Building			2,395 07	
Colored High School			3,715 29	
Polytechnic Institute			1,540 42	
Old Colored Polytechnic Institute			394 46	
No. 1 School, northeast corner Fayette and Green		streets	2,027 25	
2	"	Gough and Stiles streets	694 26	
3	"	Eastern and Mountford avenues.	967 47	
4	"	Hanover and Lee streets	2,152 37	
5	"	Broadway and Ashland avenue.	540 38	
6	"	Ann street, near Canton avenue.	1,493 58	
7	"	Mullikin street, near Aisquith..	811 81	
8	"	Caroline street, near Lombard...	889 05	
9	"	northwest corner Fayette and Green streets	2,695 98	
10	"	1724 Frederick avenue	2,826 99	
11	"	Gilmor and Mosher streets	1,946 27	
12	"	Barre and Warner streets	576 34	
13	"	Patterson Park avenue and McElderry street	283 65	
14	"	Linden avenue and Wilson street	639 92	
15	"	Carrollton ave. and Saratoga st..	434 54	
16	"	Harford and Ashland avenues ..	983 31	
17	"	Light and Poultney streets	879 29	
19	"	Hollins street, near Monroe	585 11	
20	"	Preston and Eden streets	761 44	
21	"	Pennsylvania ave. and Robert st.	623 05	
22	"	Ramsay and Scott streets	301 86	
23	"	Gough and Wolfe streets	3,540 10	
24	"	Fait avenue and Patuxent street.	1,146 07	

No. 25	School,	Bond street, near Canton avenue	$ 532 19
26	"	Orleans street, near Bond.....	1,955 35
27	"	Fayette and Chester streets.....	2,995 48
28	"	Battery ave. and Clement st.....	559 13
29	"	Sharp street, near West.....	1,653 43
30	"	Hollins street, near Monroe.....	860 74
31	"	Schroeder and Pierce streets.....	467 26
32	"	Guilford and Lanvale avenues..	1,214 77
33	"	Light and Clement streets.....	878 09
34	"	James street, near Carey.....	1,778 78
35	"	Hanover street, near Winder....	526 11
37	"	Patterson Park avenue and Biddle street	188 76
38	"	Chesapeake and Hudson streets.	208 21
39	"	Carrollton and Riggs avenues...	369 09
42	"	Broadway and Bank street	1,091 55
43	"	High street, near Fayette.	1,146 60
44	"	Sharp street, near Montgomery..	1,151 40
45	"	Greenmount ave. and Eager st...	310 62
46	"	Division street, near Lanvale....	945 60
47	"	Eastern avenue and Patuxent...	1,147 97
48	"	Hollins and Monroe streets.....	1,274 33
50	"	Gorsuch avenue and Tyler street	450 85
51	"	York road, near Merryman's La..	1,782 11
52	"	Oak and 24th streets.....	1,063 80
53	"	26th and St. Paul streets.... ...	209 02
54	"	25th street, near Charles.....	1,080 05
55	"	Chesnut avenue and 37th street.	205 56
57	"	Church st., near Merryman's La.	1,799 25
58	"	Woodberry ave.,near Hooper ave.	209 07
60	"	Francis and Clifton streets.....	693 33
60	Annex	Clifton street, near Penna. ave..	154 21
61	School,	Linden avenue and Koenig street.	1,592 62
63	"	Ninth and Northwest streets.....	1,329 31
65	"	Bloomingdale road.....	355 75
66	"	Old Frederick rd., near 13th st...	331 70
67	"	Old Frederick rd., near Fairview.	423 13
68	"	Millington ave. and Lehman st.	443 39
70	"	William street and Warren ave..	1,154 53
71	"	Bond and Jefferson streets.....	521 36

No. 72	School,	Ridgely street, near Barre.....	$ 502 92	
73	"	Aisquith street, near Lexington..	675 41	
75	"	Carrollton ave. and Lexington st.	1,823 51	
76	"	Hull and Clement streets.....	1,182 13	
77	"	Washington st., near Fayette....	2,190 52	
78	"	Harlem avenue and Monroe st...	2,512 43	
79	"	Park avenue and Hoffman street.	171 78	
80	"	Eden and Federal streets.....	2,444 31	
81	"	Gilmor and Presstman streets....	1,909 66	
82	"	Mulberry street, near Fremont ..	1,069 21	
91	"	Pennsylvania ave. and Dolphin st.	824 65	
92	"	Charles and Ostend streets.... ..	963 47	
93	"	Baltimore street, near Aisquith..	554 56	
94	"	Chase and McDonough streets...	337 45	
95	"	Lexington street, near Fremont..	1,288 61	
96	"	Ramsay and Smallwood streets..	2,872 12	
99	"	North ave. and Washington st...	3,094 55	
100	"	Saratoga street, near Charles. ...	307 71	
101	"	Jefferson street, near Caroline....	119 21	
102	"	Howard and Montgomery streets.	107 94	
105	"	Rogers ave., near Lexington st...	2,317 63	
106	"	Hill street, near Sharp.....	561 95	
107	"	Biddle st., nr. Pennsylvania ave.	164 09	
108	"	Caroline street, near Bank.....	474 36	
109	"	Barre street, near Eutaw...	656 64	
110	"	Waesche street, near Fremont...	2,249 34	
111	"	Bond street and Ashland avenue.	229 39	
112	"	Carey and Chappell streets.....	865 77	
113	"	Girard avenue and Sherman Pl..	2,235 69	
115	"	Merryman's lane, near York road	258 22	
116	"	Druid Hill ave., near Biddle st..	1,063 79	
				$40,586 19

Rented Buildings.

No. 10	Branch,	833 Hollins street....	$ 101 74
36		2223 East Baltimore street.....	304 38
43	Branch,	124-126 High street	1,146 60
49		808 North Calvert street.....	110 04
51	Branch,	Gilmor lane, near York road....	4 76
56		Hickory ave., near 37th street ..	260 28
59		Park Heights avenue.....	36 06

62	North avenue and Payson street.	$ 94 70	
64	North Walbrook	163 16	
60 Branch,	Harford avenue and Federal st.	4 00	
80 "	Caroline street	8 00	
97	117-119 Jackson Place	347 01	
103	Stricker and Mulberry streets	141 19	
103 Branch,	Edmondson avenue and Bloomingdale road	436 73	
114	1611 West Saratoga street	86 44	
118	Gold and Calhoun streets	12 72	
			$3,257 81

MARKETS.

Richmond Market	$ 517 98	
Belair Market	1,258 26	
Hanover Market	97 37	
Cross Street Market and Hall	84 62	
Broadway Market	352 26	
Northeast Market	49 07	
Canton Market	39 00	
Centre Market	850 47	
Lexington Market	1,213 55	
Hollins Market	150 87	
Lafayette Market	133 56	
		4,744 01

No. 1	Engine House and No. 2 Hook and Ladder Co., Paca street near Fayette	$3,390 76
2	Engine House, Barre street near Sharp	1,407 31
3 "	Lombard street near High	6,886 14
4 "	Lexington st. near North.	89 48
5 "	and No. 3 H. & L. Co., Ann street near Gough.	1,266 08
6 "	Gay and Ensor streets	394 00
7 "	Druid Hill ave. nr. Eutaw	375 68
8 "	Mulberry st. nr. Schroeder	3,006 85
9 "	Madison and McDonogh.	600 92
10 "	Columbia ave. near Poppleton	105 60
11 "	Eastern and Patterson Pk. avenues	306 62
12 "	Fort and Riverside aves.	2,688 43

No. 13	Engine House,	Fremont and Myrtle aves.	$ 1,575 72	
14	"	Hollins st. near Monroe.	10,665 08	
15	"	Lombard st. near Howard	408 89	
16	"	(Fire Boat) Thames street.	9 38	
17	"	Fort ave. and Haubert st.	747 64	
18	"	21st street near Md. ave.	7,342 35	
19	"	Bond st. and North ave.	374 08	
20	"	and No. 3 Chemical Co., W. North ave. near 10th street	584 44	
21	"	and No. 9 H. & L. Co., and No. 7 Chemical Co., Roland ave. and Oliver place	197 94	
No. 1	H. & L. Co.,	Harrison st. near Fayette..	272 14	
4	"	Biddle st. nr. Druid Hill av.	347 48	
5	"	Aisquith street near Oliver.	125 92	
6	"	Ostend and Hanover streets.	259 41	
10	"	Lafayette ave. nr. Stricker.	297 52	
11	"	21st street and Md. avenue.	2,244 43	
No. 1	Chemical	and No. 8 H. & L. Co., Brunswick st. and Frederick road.	1,667 03	
2	"	Maryland ave. and Retreat st.	48 12	
4	"	and No. 7 H. & L. Co., Waverly.	472 88	
				$49,158 32
City Morgue			$ 9 30	
Old Southern Police Station			74 31	
City Dock			108 74	
Potters Field			205 21	
Fifth Regiment Armory,			78 71	
				476 27
				$182,430 25

Respectfully submitted.

EDW. D. PRESTON,

Inspector of Buildings.

DEPARTMENT OF PUBLIC IMPROVEMENTS,

SUB-DEPARTMENT—HARBOR BOARD.

ANNUAL REPORT

—OF THE—

HARBOR BOARD

—TO THE—

Mayor and City Council of Baltimore

—FOR THE—

Fiscal Year Ended December 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

DEPARTMENT OF PUBLIC IMPROVEMENTS.

Sub-Department—Harbor Board.

BALTIMORE, MD.

JANUARY, 1903.

N. H. HUTTON, Harbor Engineer,
President.

CLARENCE SHRIVER,
Secretary.

JOHN K. OBER,

A. FRANK GILBERT,

GEORGE R. WILLIS,

JAMES H. IRVIN,
Clerk.

REPORT.

OFFICE OF THE HARBOR BOARD OF BALTIMORE,
BALTIMORE, January, 1903.

To the Honorable the Mayor and City Council of Baltimore:

GENTLEMEN: The Harbor Board has the honor to submit herewith its report of the operations of this Sub-Department during the year 1902.

The several sub-divisions of public work in charge of the Board are as follows:

1. Harbor maintenance and improvement, including the maintenance and operation of the tug "Baltimore."

2. Ice-boats, their maintenance, repair and operation when required.

3. Wharves, including the construction and repair of all city wharves, bulkheads, etc.; the general supervision of all wharves and bulkheads, with a view to the enforcement of all laws regulating the construction and condition of piers and bulkheads; also the granting of permits to construct, extend, or alter piers or bulkheads.

4. The supervision of "anchorages" and the enforcement of all laws and regulations relating to the anchoring of vessels in the harbor.

5. The removal of unsanitary floating matter from the harbor and docks.

6. The reception and disposal of ashes from tow boats.

7. As occasion may require, the removal of vessels sunken in the harbor.

Appropriations for the work of the Board for the year 1902, were as follows:

Salaries (Engineer and Clerk)	$ 5,200 00
Harbor	40,982 00
Iceboats (appropriation $15,000, received for sundry services $165)	15,165 00
Repairs of wharves	11,000 00
Removal of ashes (appropriation $900, from Contingent Fund. $125)	1,025 00
Removal of floating matter	1,350 00
Incidentals (appropriation $435, from Contingent Fund $15)	450 00
Making a total of	$75,172 00
*Of this amount unexpended balances were	1,527 05
Leaving gross expenditures of	$73,644 95

HARBOR.

Proposals for the necessary dredging during the year were opened by the Board of Awards on April 23d, as follows:

Name of Bidders.	Price Per Cubic Yard.			
	Docks, Including Middle Branch.	Back Basin.	Harbor and Channels.	Channels Middle Branch.
Md. Dredg. & Contr. Co.	16c.	16c.	12c.	14c.
Sanford & Brooks Co...	15½c.	15½c.	12c.	14c.

The contract was awarded to the Sanford & Brooks Co., as the lower bidder.

Work under this contract was commenced with one dredging machine on May 12, and a second machine on June 3. The contract was completed on September 3.

There was excavated and removed (mainly to the bay), 227,630 cubic yards, for which the contracting company was paid $31,459.26, or at an average rate of $13\frac{824}{1000}$ cents per cubic yard.

*Of this $1,152.44 is available for contract not completed.

This work was distributed as follows:

Back Basin and Docks:		
Back Basin	68,801	cubic yards.
Piers 2 and 3 Light street	897	"
Light and Pratt streets	950	"
Light and Lee streets	414	"
Between Cable and South streets	1,320	"
East and West sides Draw Bridge	5,419	"
Foot of Lancaster street	298	"
Foot of Washington street	279	"
Mouth Harris Creek sewer	4,386	"
North side Schall's Pier	554	"
Bush Street Dock	14,416	"
Mouth Eutaw street sewer	930	"
Between Howard and Eutaw streets	3,066	"
Ranstead's Bulkhead (Consumers Coal Co.)	572	"
Total Back Basin and Dock Work	102,302	"
Harbor and Channels:		
Entrance to Block street draw	7,859	"
Mouth of Harris Creek (outside)	5,321	"
In front of new Penna. R. R. pier, Canton	15,237	"
Anchorage No. 3	68,756	"
Total	97,173	"
Channels in Middle Branch:		
Main Channel	6,666	"
Bush Street Channel	21,489	"
Total	28,155	"

The total dredging done, and cost as to contractor was:

From Back Basin and Docks	102,302 cubic yards	at 15½c.	$15,856	80
From Harbor and Channels	97,173 "	12c.	11,660	76
From Channels in Mid. Branch.	28,155 "	14c.	3,941	70

The areas covered by this work were:

Docks and Back Basin	754,000	square feet.
Harbor and Channels	746,750	"
Making a total of	1,500,750	"

or about 34½ acres. The area covered by dredging was 166,750 square yards, and the total quantity of material removed was 227,630 cubic yards, making the average depth of excavation $1\frac{36}{100}$ yards, or 4 feet 1 inch.

DESCRIPTION OF WORK DONE.

All docks requiring the work were dredged to hard bottom, varying in depth from 12 to 16 feet.

In addition, McClures' and Broadway docks, which are too narrow for use of dredging machines, were "scraped" to about 12 foot depth. The Back Basin (or City Dock) was dredged to re-establish a depth of 15 feet, and Jones' Falls, from Canton avenue bridge to basin, was dredged to 18 feet, to form a "catch basin" for deposits from above. The channels through the drawbridge were dredged to 15 foot depth, and the entrance to basin from the harbor to 16 and 17 feet.

The depth of 30 feet in ship channel on Canton side of harbor, was extended about 450 feet northward to accommodate the large new pier of Penna. R. R. Co.

The depth of 27 feet on Anchorage No. 3 was extended northward 250 feet, increasing the area of 27 foot depth about 11 acres.

In the Middle Branch (or Spring Gardens), the channel to Bush Street Dock was re-established to a depth of 16 feet for a width of 65 feet; and the dock was re-dredged to same depth and width.

Deposits above 12 foot depth were removed from head of this branch from Howard to Eutaw street.

The Tug Baltimore was actively engaged during January and February in preventing obstruction by ice to navigation in the harbor and middle branch; at other times it was employed for general police of harbor and river, assisting in and supervision of dredging, and of the anchorages in the harbor.

The appropriation for this work was.....	$40,982 00
And expenditures.....	40,964 23
Leaving an unexpended balance of.....	$ 17 77

ICEBOATS.

The iceboats were in service for relieving commerce from obstruction by ice, from January 6 (as to the Annapolis), and from January 31 (as to the Latrobe), until March 1.

In addition to the duty of assisting all vessels and tows through the ice, a large steamship and several large coasting schooners were hauled off of shoals where forced by ice, and special relief rendered the Ericsson, and Chester River lines, the Queen Anne's Railway Company, the Baltimore, Chesapeake & Atlantic Railway Co., the Chesapeake & York River Line and the Old Bay Line; and by direction of the Governor, the harbors of Eastern Bay and Miles River were relieved of obstruction by ice.

The ice was very heavy and troublesome during February, and the expenditures consequently very large; amounting to about $8,000, or near one-half the total amount appropriated for the year.

The Latrobe has made by order of Council the following trips:

May 16, Nat'l Assoc'n Piano Makers and Dealers.
June 18, " " Printers' Pressmen.
July 7, " " Boiler Makers.
July 15, Aged Peoples Outing Association.
Aug. 6, Hibernian Association.

Commencing on June 5, this boat made 12 trips to and from Chesterwood for the Free Summer Excursion Society, conveying 16,876 passengers; on the five trips for various associations as above, 1,963 passengers were carried, making for the year a total of 18,839 passengers.

The Legislature at its last session (Chap. 570, Acts 1902), appropriated for the use of the Annapolis (of which the State owns one-half), the sum of $5,000 per annum for two years. Under this appropriation a thorough overhauling and repair of this boat was made, especially of the wheels, which were almost entirely rebuilt. No considerable amount of repairs to wood work of this boat has been made since

it was built, about 18 years ago. In consequence very extensive repairs were required to wood work of house, etc. All iron work of hull was cleaned and painted. All pipes and valves were overhauled and renewed where required; new condenser tubes purchased, electric light plant overhauled and improved. All wood work of house, decks, etc., repainted by the crew.

Both boats are now in excellent condition for work.

The appropriation for iceboats for 1902 was	$15,000 00
Received for cost of sundry services of iceboats	165 00
Total	$15,165 00
Expenditures were	15,000 00
Leaving unexpended balance of	$ 165 00

UNDER STATE APPROPRIATION.

For the "Annapolis" expenditures were as follows:

Crew	$2,169 41
Fuel	6 50
Repairs	1,796 40
Steamboat supplies	613 92
Wharfage	125 00
Advertising	14 72
Total	$4,725 95
Unexpended balance	274 05
Appropriation	$5,000 00

REPAIRS OF WHARVES.

The following repairs of wharves and bulkheads were made during the year at costs as named:

**Bulkhead at Cable Street.*

This work was completed in 1901, except paving in rear of wall and a plank protection to oak fender. The paving with vitrified brick and heavy kerbing was done under the City Engineer's Department by the courtesy of the head of that Department, who furnished expert agents for the pavement and kerbing desired, (as also for the South Street Bulkhead). Costs for this work were $ 636 25

*See Appendix Page 25.

**South Street Bulkhead.*

This bulkhead was entirely rebuilt under a contract with the Sanford & Brooks Co., and under the same specifications as for the Cable Street Bulkhead, at prices as follows:

Excavating, removal of old material and paving per 100 linear feet	$ 300 00	
Masonry per cubic yard	7 40	
Coping per linear foot	2 40	
Yellow pine timber in place per 1,000 feet	28 00	
White oak fender per 1,000 feet	35 00	
Pine piles per pile driven and cut off	5 90	
Iron per pound	03	
Expenditures on this account were		4,627 96

Calvert Street Wharf.

This wharf was rebuilt as to caps, flooring and fender piles at a cost to city of ..... $ 106 43

Charles Street Wharf.

New flooring was furnished and put in place by Naval Reserve, cost ..... $ 21 60

Long Dock.

Under contract with Sanford & Brooks Co. about 80 linear feet of old stone bulkhead was removed and rebuilt at following rates:

Yellow pine timber in place per 1,000 feet	$ 38 00	
Yellow pine piles driven and cut off	5 75	
Masonry, per cubic yard	6 50	
Coping, per linear foot	1 50	
Excavation, removal of old material and refilling in rear of wall, per linear foot	2 50	
358 feet linear platform was also built with guard logs.		
Cost of all repairs was		2,112 48

Bowly's Wharf.

Sundry minor repairs 111 70

Wharf at City Yard.

This old wharf was rebuilt under contract with Sanford & Brooks Co. at same prices as for Long Dock at a cost of 816 74

*See Appendix Page 25.

Foot of Caroline Street.

Old bulkhead rebuilt. Cost..... 136 16

Back Basin (City Dock).

New oak fender piles and Georgia pine caps put in place. Cost..... 348 24

Foot of Gay Street.

Repair of guard log. Cost..... 4 84

	$8,947 56
General supervision.....	900 00
Total expenditures (1902).....	$9,847 56
Balance carried to 1903.....	1,152 44
Appropriation.....	$11,000 00

WHARF PERMITS—1902.

The following permits for the construction, alteration, etc., of piers or bulkheads have been issued by Board during the year.

No.	Name.	Location.	Granted.
38	Balto. Ches. & At. R. Co...	To extend South St. Wharf.	March 5.
39	Maine Lake Ice Co.....	Drive piles ft. Wills st.....	March 14.
40	Julius A. Eppley, agt.....	Ext. bulk. rear 211 South st..	May 15.
41	Balto. & Ohio R. Co.....	To extend Pier 23.....	June 4.
42	Balto. & Ohio. R. Co...	Bulk. foot Fell st.....	Aug. 18.
43	Balto. & Ohio R. Co.....	Pier adj. its Piers 8 and 9...	Aug. 18.
44	Spring Garden Wharf & Land Co.....	Extension at Bayard st.....	Aug. 18.
45	Hazard Whf. Co.....	Transfer Bridge Lazaretto Pt.	Sept. 3.
46	Hazard Whf. Co.....	Two wharves Lazaretto Pt..	Oct. 8.
47	Balto. Cop. Smelt. & Rol. Co.	Pier bet. 4th and 5th aves...	Nov. 12.
48	Hammond Ice Co.....	Bulk. E. of Jones' Falls.....	Nov. 25.
49	Slee & Eisenbrandt.....	Whf. foot Marshall st.....	Dec. 26.

ANCHORAGES.

By Ordinance 53 May 7, 1902, the charge of anchorages in the harbor was transferred from the assistant to Harbor Master, for the First District, to the Harbor Board.

Before undertaking to regulate the location of vessels in the anchorages, it was found to be necessary to have several new buoys provided to replace those lost or broken, as well as a few additional ones to mark anchorages 2 and 3, as rearranged by Ordinance 142 May 21, 1901. It was found impracticable to obtain the required buoys from the National Government (Light House Department), and they were procured by the Board, and paid for by the Comptroller from receipts for wharfage, etc. Through the courtesy of Commander Hawley, United States Naval Inspector, Fifth Light House District, the new buoys were placed in position by the United States buoy tender.

Copies of the ordinance, with the regulations governing all matters connected with the subject, have been printed and distributed to all persons presumably interested. The Master of the Tug Baltimore has been placed in charge of the execution of these laws and regulations, assisted by the Harbor Master Assistant for the First District.

It is very desirable that the buoys, marking the limits of the anchorages, should be furnished and maintained by the General Government, nor does this Board consider it an unreasonable measure, as these buoys are really channel buoys, since they mark in the harbor the limits of the "fair way" for vessels using the harbor.

The Board has done its utmost in the past two years to secure, through our Congressional delegation, the recognition of the propriety of granting the city the buoys desired, but so far without success.

A copy of the Law and Regulations relating to anchorages will be found in the appendix, page 22.

REMOVAL OF FLOATING MATTER.

The removal of unsanitary matter floating in the harbor has been continued during the summer, as heretofore.

The appropriation for this work was	$1,350 00
The expenditures	1,158 19
Leaving unexpended balance of	$191 81

REMOVAL OF ASHES FROM TOWBOATS.

The scow used for the reception of ashes from towboats has been in service during the year except for a few days during time occupied in making necessary repairs. These were found, after scow was hauled on railway, to be so much more extensive than supposed, that the Board was compelled to ask relief from Board of Estimates, to enable the scow to be continued in service.

There was received on this scow 39,344 bushels of ashes, from 68 towboats and two steamers. Ten (10) loads of ashes were removed and deposited behind bulkheads, without cost to the city, and one (1) was unloaded at a cost to city of $12.00.

The appropriation for use of this scow was		$ 900 00
There was received from Contingent Fund, Board of Estimates		125 00
Making total available		$1,025 00
Expenditures amounted to	$975 97	
By order Board of Estimates there was paid on account iceboats (out of the $125 received from Cont. Fund	49 00	
		10,24 97
Leaving an unexpended balance of		03

REMOVAL OF WRECKS.

The schooner Maria Elizabeth sunk on Anchorage No. 3, in a bad position for navigation, was raised and removed under contract with L. E. Broome, for $150, which was paid by the Comptroller as per Art. 22, Sec. 10, City Code. The owner was a non-resident, and could not be located or heard from.

APPROPRIATIONS FOR 1903.

The following amounts have been appropriated for the several works under charge of the Board:

Salaries (engineers and clerk)	$ 5,200 00
Harbor	49,382 00
Ice boats	14,680 00
Repairs of wharves	5,000 00
Removal of ashes	900 00
Removal of floating matter	1,350 00
Incidentals	500 00
Total	$77,012 00

For details of expenditures and of work done, reference is respectfully requested to the annexed tabular statements.

The Board takes pleasure in stating that the officers and employes of the Board have faithfully performed their respective duties.

Respectfully submitted,

N. H. Hutton,
Clarence Shriver,
John K. Ober,
A. Frank Gilbert,
George R. Willis.

TABLES.

HARBOR.

Year Ended December 31, 1902.		Dr.	Cr.
Appropriation:			
Ordinance 5, October 25, 1901		.....	$40,982 00
Expenditures:			
Sanford & Brooks Company.	97,173 cubic yards, 12c. 28,155 " " 14c. 102,302 " " 15¼c.	$31,459 26	
Advertising		94 96	
Supervision of dredging		1,960 82	
Sundries		1 35	
Surveys		320 83	
Tug Baltimore:			
Crew	$4,377 25		
Fuel	557 52		
Repairs	1,504 12		
Steamboat supplies	198 12		
Ice prow	490 00		
		7,127 01	
Unexpended balance		17 77	
		$40,982 00	$40,982 00

SALARIES.

Year Ended December 31, 1902.	Dr.	Cr.
Appropriation:		
Ordinance 5, October 25, 1901	.....	$5,200 00
Expenditures:		
Salaries	$5,200 00	
	$5,200 00	$5,200 00

ICE-BOATS.

Year Ended December 31, 1902.			Dr.	Cr.
Appropriation.				
Ordinance 5, October 25, 1901				$15,000 00
Received for sundry services of ice-boats				165 00
Expenditures.				
	**Annapolis.*	*F.C.Latrobe.*		
Advertising	$	$ 1 53		
Crew	3,753 50	6,691 17		
†Fuel	1,068 21	1,137 19		
Repairs	19 13	569 77		
†Steamboat supplies	51 14	570 90		
Subsistence	544 32	530 64		
Wharfage	62 50			
	$5,498 80	$9,501 20	$15,000 00	
Unexpended balance			165 00	
			$15,165 00	$15,165 00

* See "State Appropriation."

† See "Removal of Ashes" and "Incidentals."

INCIDENTALS.

Year Ended December 31, 1902.		Dr.	Cr.
Appropriation.			
Ordinance 5, October 25, 1901			$435 00
From Contingent Fund, December 30, 1902			15 00
Expenditures.			
Incidentals		$334 73	
Account ice-boat "Latrobe:"			
Fuel	$ 3 25		
Steamboat supplies	112 02		
		115 27	
		$450 00	$450 00

REMOVAL OF ASHES.

Year Ended December 31, 1902.		Dr.	Cr.
Appropriation.			
Ordinance 5, October 25, 1901		.....	$900 00
From Contingent Fund, October 28, 1902		.....	125 00
Expenditures.			
Supplies	$ 37 25		
Supervision of scow and dump	600 00		
Repairs	326 72		
Discharging scow	12 00		
		$ 975 97	
Acc't ice-boat "Latrobe"—Steamboat supplies		49 00	
Unexpended balance		03	
		$1,025 00	$1,025 00

REMOVAL OF FLOATING MATTER.

Year Ended December 31, 1902.	Dr.	Cr.
Appropriation.		
Ordinance 5, October 25, 1901	.....	$1,350 00
Expenditures.		
Wages	$1,104 49	
Outfit	53 70	
Unexpended balance	191 81	
	$1,350 00	$1,350 00

REPAIRS OF WHARVES.

Year Ended December 31, 1902.		Dr.	Cr.
Appropriation :			
Ordinance 5, October 25, 1901			$11,000 00
Expenditures:			
Repairs to wharves			
Advertising	$25 16		
South street bulk	4,627 96		
Cable street bulk	636 25		
Calvert street wharf	106 43		
Charles street wharf	21 60		
Long dock	2,112 48		
Bowly's wharf	111 70		
City Yard wharf	816 74		
Foot Caroline street	136 16		
Back basin	348 24		
Foot Gay street	4 84		
		$8,947 56	
General supervision		900 00	
Balance available for contract not completed		1,152 44	
		$11,000 00	$11,000 00

REMOVAL OF WRECKS.

Year Ended December 31, 1902.	Dr.	Cr.
Appropriation		As per Art. 22, Sec. 10, City Code.
Expenditures	$150 00	

STATE APPROPRIATION.

Year Ended December 31, 1902.		Dr.	Cr.
Appropriation:			
Chapter 570, Acts of 1902.			$5,000 00
Expenditures:			
*Iceboat Annapolis:			
Crew	$2,169 41		
Fuel	6 50		
Repairs	1,796 40		
Steamboat supplies	613 92		
Wharfage	125 00		
Advertising	14 72		
		$4,725 95	
Unexpended balance		274 05	
		$5,000 00	$5,000 00

*See "Iceboats."

Respectfully submitted,

JAMES H. IRVIN, *Clerk.*

Approved:

N. H. HUTTON, *Harbor Engineer.*

APPENDIX.

Department of Public Improvements,
Sub-Department—Harbor Board,
Baltimore, Md.

ANCHORAGES.

Ord. No. 142 *May* 21, 1901, *Sec.* 20.—Anchorages.

1. The Harbor Board is hereby authorized and directed to cause anchorages No. 1, No. 2, No. 3 and No. 4, to be marked by buoys or otherwise.

Ibid., *Sec.* 21, Anchorage No. 1.

2. Anchorage No. 1 shall be within these lines, namely: South of a line drawn from the west corner of Shaw's coal pier to the northeast corner of the pier at Beacham and Brothers' shipyard. No vessel shall anchor within 500 feet of any pier fronting this anchorage.

Ibid. Sec. 22.—Anchorage No. 2.

3. Anchorage No. 2 shall be within these lines, namely: A line drawn from the southern corner of Waters' northern wharf to the northern corner of Baker-Whitely Coal Company's wharf (foot of Ninth street) until it intersects a line drawn from the easternmost end of Ober's wharf to the southwestern corner of Canton Company's bulkhead; thence northeasterly along said last described line. No vessel shall anchor within 300 feet of any pier or bulkhead fronting this anchorage.

Ibid., *Sec.* 23.—Anchorage No. 3.

4. Anchorage No. 3 shall be within these lines, namely: A line drawn from the southern corner of Waters' northern wharf to the northern corner of Baker-Whitely Coal Com-

pany's wharf (foot Ninth street) until it intersects a line drawn from the westernmost end of the Baltimore Dry Dock Company's wharf to the southern corner of the elevator (foot Sixth street); thence easterly along said last described line until it intersects a line five hundred feet west of the new Pierhead Line parallel to same, thence northerly along said last described line until it intersects a line drawn from the northern corner of the Baltimore Copper Company's bulkhead to the easternmost end of Ober's wharf, thence westerly along said described line until it intersects the first described line.

Art. 22, *Sec.* 24.—Anchorage No. 4.

5. Anchorage No. 4 shall be within the following described lines, viz: Southeast from Fort McHenry and southwest of a line drawn parallel to the ship channels and 300 feet distant therefrom.

Ord. No. 53, *May* 7, 1902.—Use of Anchorage.—Penalty.

6. The anchorage shall be used only as permitted by the Harbor Board, which may prescribe the time vessels may occupy the anchorage and the terms and conditions upon which they may load and discharge cargoes therein. All vessels anchoring in the harbor shall anchor so as to keep within one of said anchorages, and be subject to all rules and regulations which the said Board may enforce. All vessels when at anchor between sunset and sunrise shall show a white light where it can be seen best at a height about twenty feet above the hull; any vessel anchored so as to obstruct the free passage of any other vessel to or from any wharf or dock, shall remove to such place as the Harbor Board may direct upon a half hour's notice, and if no person be on such vessel upon whom said notice can be served, then the said Board must have such vessel removed and the expense for the same shall be paid to the Harbor Board by the master of such vessel. The master of any

vessel violating this ordinance shall pay a penalty of twenty ($20.00) dollars and a further penalty of five ($5.00) dollars for every hour the offence continues, said penalty to be collected as other fines and forfeitures are collected.

REGULATIONS ADOPTED BY THE HARBOR BOARD UNDER ORDINANCE NO. 53 OF 1902.

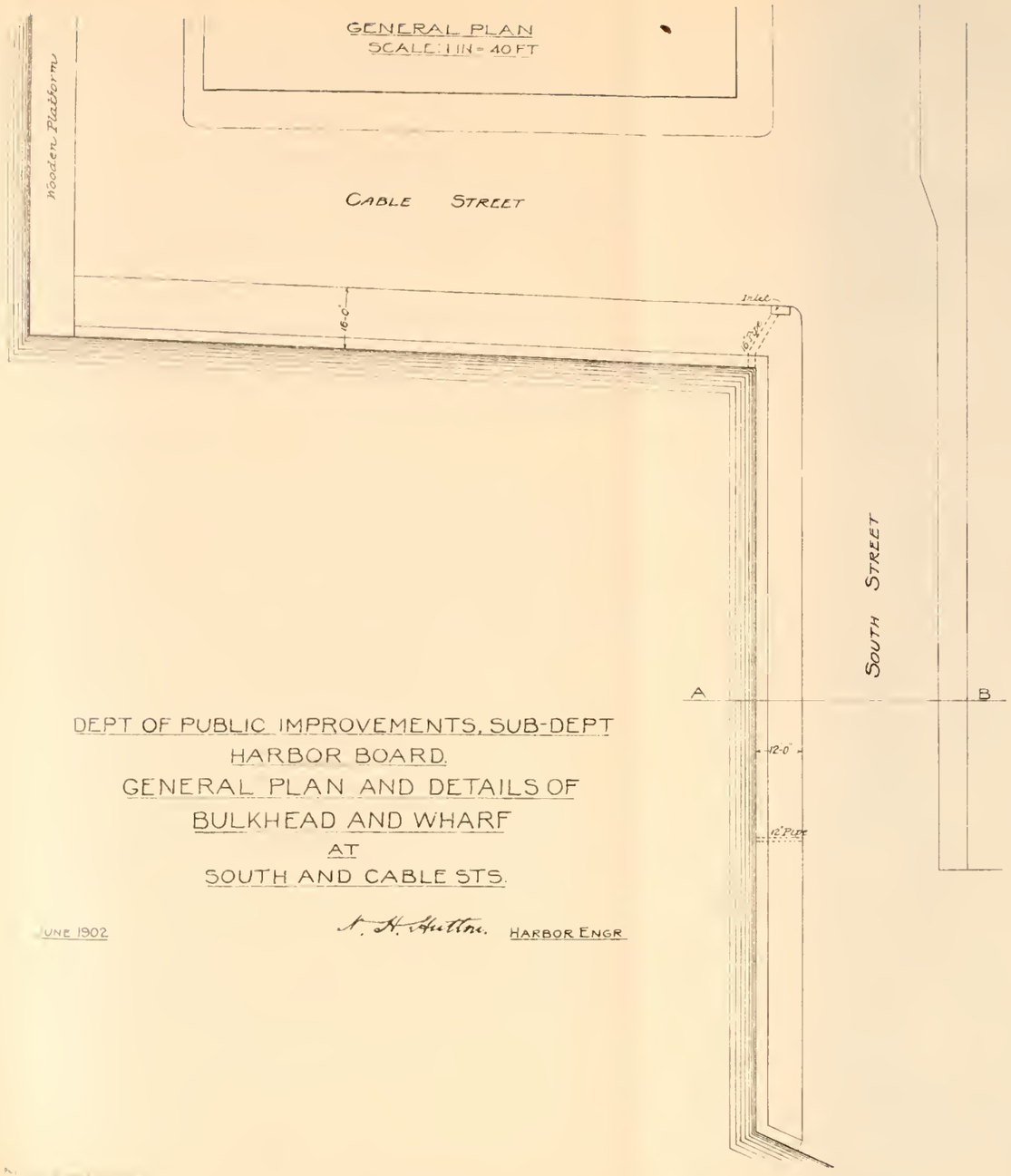
1. Anchorages are marked by white buoys. Vessels must anchor so that no portion of the hull shall at any time project beyond the line of anchorage buoys.

2. Vessels to remain on the anchorage more than one week must file with Harbor Board a satisfactory guarantee to pay any expense incurred by reason of said vessel sinking from any cause.

3. Vessels on the anchorage shall be inspected at least twice a week, and any vessel found leaking or in generally bad condition shall be removed from the anchorage at the expense of the vessel.

4. The master of the city tug Baltimore is charged with the duty of carrying out all provisions of the laws and regulations relating to the anchorage, and shall be obeyed and respected accordingly.

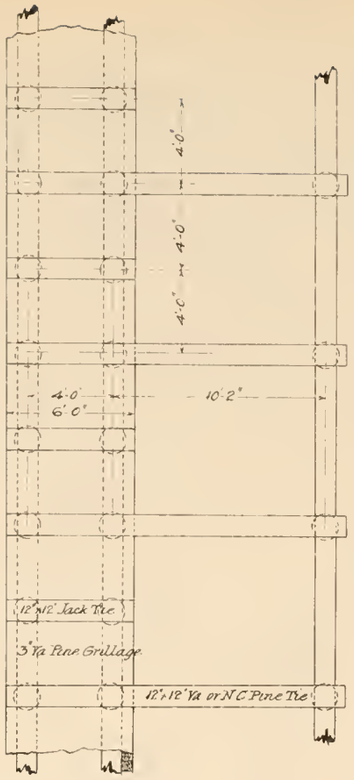
5. The tug Baltimore will carry on forward flagstaff a blue signal flag marked in white "Harbor Board" with anchor in center.



DEPT OF PUBLIC IMPROVEMENTS, SUB-DEPT
HARBOR BOARD.
GENERAL PLAN AND DETAILS OF BULKHEAD AND WHARF AT SOUTH AND CABLE STS.

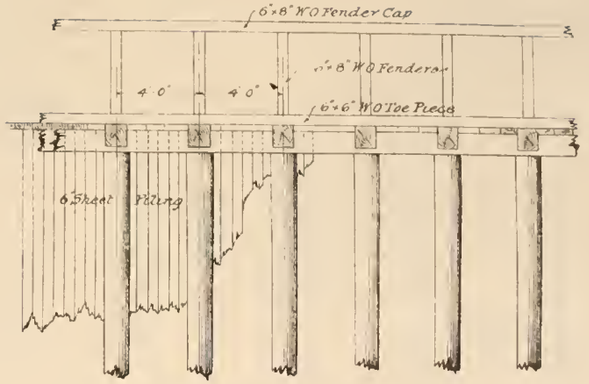
JUNE 1902

N. H. Hutton. HARBOR ENGR

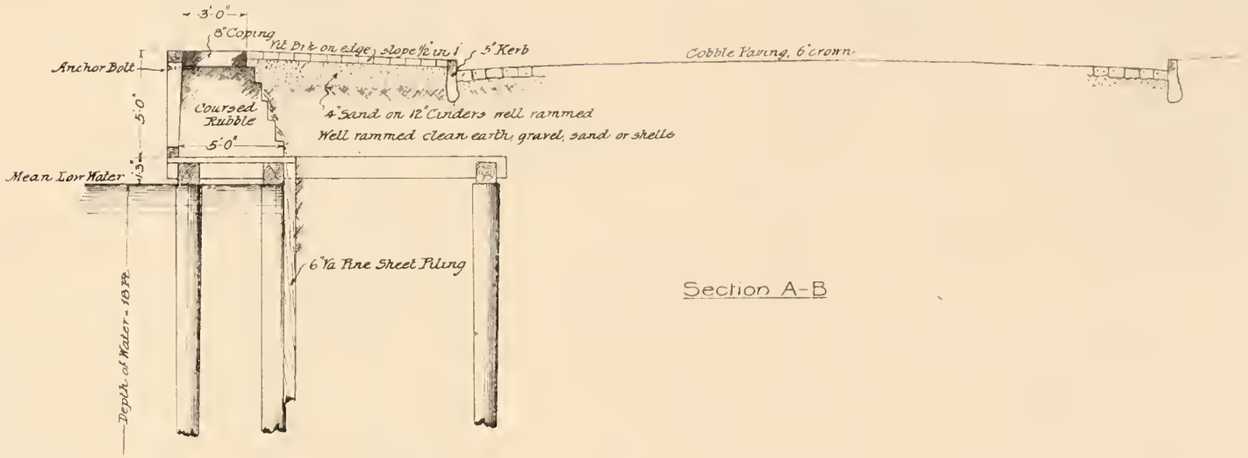


Foundation Plan.

DETAILS
SCALE 1 IN = 8 FT.



Elevation



Section A-B

SPECIFICATIONS

Of labor, work and material required to be furnished for the removal of old work, and the construction of new Stone Bulkhead, on pile and timber foundations, at.....

Generally.

It is intended to remove entirely (including wall, piles and timbers) the old bulkhead at..... ..... and to rebuild the same as per plans on file in the office of the Harbor Board, which shall form a part of these specifications, and of the contracts.

Excavations, Refilling, Etc.

The contractor shall make all excavations and removals necessary to execute the new work as per plans above referred to, and shall, after the completion of the masonry, do all filling, grading and paving necessary to bring space in rear of wall to street-level, and shall only pave the whole area after the filling has settled, which may be done by "ramming," as filling above low water-level is put in.

Kind of Filling.

None but clean earth, sand, gravel or shells will be permitted to be filled in behind the new wall.

Protecting Excavations.

The contractor shall at all times provide such protections as will prevent any injury to persons or property by reason of any works carried on under the specifications.

New Work Generally.

The whole work will be done and completed in strict accordance with the drawings thereof, hereunto annexed, and which form a part of the specifications.

It is the intention of these drawings and specifications to show everything that may be necessary for the due, proper and complete performance of the whole work in a neat, strong and workmanlike manner, and the contractor will be required to so execute and complete the work without extra charge or cost to the city; anything herein omitted or misstated to the contrary notwithstanding.

Piling.

All piles (except sheet and fender piles) will be of sound, live, yellow pine, straight and well-shaped. They must measure 14 inches in diameter at the butt *where cut off*, and not less than 8 inches at the point—all clear of bark.

Pile Driving.

They must be driven fair, true and straight, in their required positions, to a depth *not less* than 24 feet below mean low water (as established by the Harbor Board) and as much deeper as they can be driven by a 2,000 pound hammer falling 15 feet.

Cutting Off Piles.

They must be cut off square and level at mean low water, and no blocking up or notching of caps to make a fit will be permitted. Piles must be cut off under water if necessary.

Alignment.

All piles that do not come fairly in place under caps when they are truly aligned must be removed and redriven.

Bands and Shoes.

All piles must be banded and shod, if found necessary so to do, to get them to required depths without "brooming" either butts or points.

Sheet Piling.

The sheet piling will be of sound, *select* 6-inch North Carolina or Virginia yellow pine, straight, square-edged, free from shakes or loose knots.

Cutting Off. Fastening.

It must be driven vertically true and straight, square against caps, with close joints, to a depth not less than 20 feet below mean low water. The tops will be sawed off level with top of cap, and every 12 inches in width of sheet piling will be secured to caps by two ¾-inch square bolts 12 inches long, with ragged points.

Open Joints.

All open joints in sheet piling will be made tight at the expense of the contractor.

Caps, Ties, Etc.

The caps, ties and all other timber will be sound, straight, square-edged stuff, free from any kind of imperfection injurious to strength or durability. They will be of selected North Carolina or Virginia pine, and not less than 30 feet in length.

Scarfs.

The caps will be secured to heads of piles by inch square iron bolts 20 inches long. All scarfs will be made over pile heads; they will be not less than 3 feet in length, and well secured with screw bolts having the heads and nuts countersunk.

Notches.

Where timbers are notched into each other, one-half the depth of notch will be taken out of each timber.

Bolts.

All square timbers will be secured to each other by inch-square bolts with ragged points; for 12-inch timbers their lengths will be 18 inches, and for 6-inch timbers 12 inches.

Fenders.

Fenders of white oak will be fitted and fixed as per drawings.

Toe-Piece.

The toe-piece at foot of wall will be of white oak, 6x6 inches, secured to each tie by ¾-inch square bolts 12 inches long.

Masonry.

The wall will be carried up as per drawings.

The construction must be of the style known as "first-class, rock-faced, hammer-dressed, ranged rubble."

The stones must be of sound, well-shaped gneiss or granite, free from cracks, seams or quarry scale. They must always be laid on their broadest surface; none can be edged anywhere in the wall. No stones can be used having a less rise than 10 inches, with a least bed of 12 inches and a length of 3 feet; and all stones must have at least this proportion of bed to rise.

At least one-fifth the face area of wall must be composed of headers, which will go entirely through the wall where it is 4 feet in thickness, or less, and will in other cases be not less than 3½ feet long, laid alternately in the face and back of wall.

Stones will be laid to bond well, breaking joint thoroughly. All beds and builds will be hammer-dressed to fair surfaces, and joints made vertical.

The masonry will be laid with about ⅜-inch joints, and no small stones, chips or spalls can be used, except that, occasionally, for leveling up, solid, angular pieces, well bedded in mortar, may be used. No grout shall be used in wall anywhere.

All stones shall be laid in full beds of mortar, and be well settled into place.

Coping.

The coping will be of hammer-dressed stone, with dressed joints, and in lengths not less than 4 feet.

Mortar.

The mortar will be composed of one (1) part of fresh hydraulic cement, of approved manufacture, to two (2) parts

of sharp, clean sand. All mortar must be used before the first set, and be mixed with only so much water as will make it a stiff paste, and not a semi-fluid mass.

Cement.

The cement must be free from cinders, dirt, or any inert substances, and such as does not stand the tests of the Harbor Engineer must be removed from the site of the work.

Sand.

The sand must be free from clay, gravel or earth, and must be washed, if required by the said Engineer.

Pointing.

After the wall is completed the face-joints must be raked out for ½-inch depth and refilled with pointing mortar of sand and cement in equal proportions, mixed with just enough water to enable it to be squeezed into a ball in the hand. This mixture will then be laid and settled in joints with a pointing tool and maul.

Finally.

The whole work is to be done in the best manner and with the best material and workmanship for the requirements of the several parts.

Bids.

Bids must state in *figures* and *words* price as below:

1. Price per 100 feet length of wall for all excavations, grading, paving, removing piles, timber, etc.

2. Price per pile driven and cut off, for yellow pine piles.

3. Price per 1,000 feet for oak in fender framed complete, as per plan.

4. Price per 1,000 feet, board measure, for all timber, plank, etc., including all labor and workmanship in fitting and fixing in place.

5. Price per pound of all iron bolts, spikes, ties, straps, dowels, (to include anything of iron used in the work.)

6. Price per cubic yard for all masonry laid in place, including stone, sand, cement and every item of labor and work.

7. Price per lineal foot for coping, secured in place.

The above items will include every item and thing of material, labor and work necessary to do and complete the whole work in accordance with the evident intent and meaning of the drawings and these specifications, without any extra charge or cost to the Mayor and City Council of Baltimore. Bids must state time of commencement and completion of work.

ANNUAL REPORT

OF THE

COMMISSIONER OF STREET CLEANING

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ending December 31, 1902.

BALTIMORE :
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

OFFICERS AND EMPLOYEES

—— OF THE ——

STREET CLEANING DEPARTMENT

FOR THE YEAR 1902.

PAUL IGLEHART,
Commissioner of Street Cleaning.

WILLIAM A. LARKINS,
General Superintendent.

FREDERICK G. WHELAN,
Chief Clerk.

W. D. NELSON THOMAS,
Assistant Clerk.

GERARD A. HAUSMANN,
Mileage Clerk and Stenographer.

District Superintendents.

JOSEPH HOPPS, First District.
HENRY T. DALY, Second District.
WILLIAM F. COFFAY, Jr., Third District.
EDWARD F. CALLAHAN, Fourth District.
JOHN E. GIST, Fifth District.
MICHAEL DOONAN, Sixth District.
JESSE F. HALL, Seventh District.

LEWIS D. COOK,
Superintendent of Sweeping Machines.

A. S. WILSON,
Garbage Inspector.

HUGH NOON,
Assistant Garbage Inspector.

JOSEPH W. FUNK,
Assistant Garbage Inspector.

REPORT.

Department of Public Safety,
Commissioner of Street Cleaning,

City Hall, Baltimore, January 1, 1903.

To the Honorable Mayor and City Council of Baltimore:

Gentlemen: I present herewith my report for the year ending December 31, 1902, with appended tables showing the number of employees, the work done and the cost of the various branches of the department.

Respectfully submitted.

PAUL IGLEHART,
Commissioner of Street Cleaning.

TABLES.

TABLE A.

MONTHLY REPORT OF WORK DONE IN THE STREET CLEANING DEPARTMENT, SHOWING OF STREET AND GARBAGE CARTS EMPLOYED IN EACH SEPARATE DISTRICT; 1902, TO DECEMBER 31, 1902.

MONTH ENDING.	DISTRICT NO. 1. SUPERINTENDENT.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	Joseph Hopps.....	239	3,421	1,457	.....
Feb. 28..	" "	247	3,113	6,040	$1,257 50
Mar. 31..	" "	373	4,026	2,346	1,775 00
April 30..	" "	433	2,873	1,601	1,425 00
May 31..	" "	1,106	2,465	2,033	1,782 50
June 30..	" "	1,116	1,599	1,718	1,405 00
July 31..	" "	1,214	1,103	1,523	1,435 00
Aug. 31..	" "	1,689	1,218	1,913	1,740 00
Sept. 30..	" "	1,211	1,015	1,366	1,440 00
Oct. 31..	" "	964	972	1,539	1,077 50
Nov. 30..	" "	625	1,568	1,853	* .....
Dec. 31..	" "	250	1,815	1,825	* .....
Total for year 1st District.....		9,467	25,188	25,214	$13,337 50

*Garbage collected and removed by contract from October 20.

TABLE A.

ING NUMBER LOADS COLLECTED AND REMOVED, NUMBER MEN EMPLOYED, NUMBER ALSO THE AMOUNT EXPENDED FOR TOOLS AND INCIDENTALS, FROM JANUARY 1,

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$ 1,265 47	$ 39 05	$24 50	.....	11	20	5,117	$1,329 02
1,809 48	2 97	32 73	24	10	18	9,400	3,102 68
1,735 54	96 99	53 93	24	10	18	6,745	3,661 46
1,447 84	172 30	23 13	24	10	20	4,907	3,068 27
1,942 63	264 91	22 75	24	11	21	5,604	4,012 79
1,663 99	236 28	29 56	24	11	22	4,433	3,334 83
1,613 72	252 84	26 83	24	11	22	3,840	3,328 39
1,939 53	368 08	26 81	24	10	22	4,820	4,074 42
1,353 71	250 34	25 70	24	10	22	3,592	3,068 75
1,526 05	219 89	26 69	24	10	22	3,475	2,850 13
1,863 40	236 05	24 78	24	10	22	4,046	2,124 23
1,617 14	122 06	21 66	.....	10	22	3,890	1,760 86
$19,777 50	$2,261 76	$339 07	.....	.....	.....	59,869	$35,715 83

TABLE A—Continued.

Monthly Statement of Work Done in the Street Cleaning Depart-

Month Ending.	District No. 2. Superintendent.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	Henry T. Daly.....	634	3,218	1,516	.....
Feb. 28..	" "	640	3,516	3,758	$1,300 00
Mar. 31..	" "	811	4,300	2,003	1,840 00
April 30..	" "	586	3,201	1,496	1,487 50
May 31..	" "	923	3,321	1,802	1,862 50
June 30..	" "	1,345	1,337	1,558	1,495 00
July 31..	" "	1,303	820	1,461	1,492 50
Aug. 31..	" "	1,702	853	1,800	1,855 00
Sept. 30..	" "	1,251	651	1,197	1,500 00
Oct. 31..	" "	1,011	799	1,484	1,122 50
Nov. 30..	" "	630	1,573	1,579	* .....
Dec. 31..	" "	252	1,846	1,380	* .....
Total for year 2d District.....		11,088	25,435	21,034	$13,955 00

*Garbage collected and removed by contract from October 20.

TABLE A—Continued.

ment, with the Cost of Same, in Each Separate District for the Year 1902.

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$1,488 28	$ 29 36	$ 24 50	.....	11	24	5,368	$1,542 14
1,842 35	.....	29 10	28	11	25	7,914	3,171 45
1,983 09	42 62	59 93	25	11	25	7,114	3,925 64
1,664 20	144 32	28 43	25	11	24	5,283	3,324 45
2,043 02	274 90	22 75	25	11	24	6,046	4,203 17
1,751 59	232 25	29 57	25	12	25	4,240	3,508 41
1,729 87	244 58	26 83	25	11	24	3,584	3,493 78
2,121 44	295 85	26 81	25	11	24	4,355	4,299 10
1,426 59	246 91	25 70	25	11	24	3,099	3,199 20
1,666 71	219 24	26 64	25	11	24	3,294	3,035 09
1,938 00	233 81	24 78	25	11	24	3,782	2,196 59
1,658 15	117 84	21 66	.....	11	24	3,478	1,797 65
$21,313 29	$2,081 68	$346 70	.....	.....	.....	57,557	$37,696 67

TABLE A—Continued.

Monthly Statement of Work Done in the Street Cleaning Depart-

Month Ending.	District No. 3. Superintendent.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	Wm. F. Coffay, Jr..	207	3,032	1,171	.....
Feb. 28..	" " ..	178	3,662	2,305	$1,257 50
Mar. 31..	" " ..	307	3,874	1,493	1,787 50
April 30..	" " ..	365	2,646	1,080	1,435 00
May 31..	" " ..	681	2,643	1,425	1,790 00
June 30..	" " ..	884	1,599	1,099	1,440 00
July 31..	" " ..	1,096	991	1,059	1,497 50
Aug. 31..	" " ..	1,783	828	1,367	1,872 50
Sept. 30..	" " ..	1,346	741	990	1,497 50
Oct. 31..	" " ..	1,062	905	1,177	1,125 00
Nov. 30..	" " ..	613	1,426	1,314	* .....
Dec. 31..	" " ..	272	1,555	1,188	* .....
Total for 3d District.....		8,794	23,902	15,668	$13,702 50

*Garbage collected and removed by contract from October 20.

TABLE A—Continued.

ment, with the Cost of same, in Each Separate District for the Year 1902.

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$ 1,126 01	$ 19 30	$ 27 33	.....	8	17	4,410	$1,172 64
1,072 69	.....	25 30	24	8	17	6,145	2,355 49
1,437 18	55 30	52 41	24	8	17	5,674	3,332 39
1,197 28	98 02	22 50	24	8	16	4,091	2,752 80
1,502 55	115 44	42 25	24	8	16	4,749	3,450 24
1,224 00	101 77	31 07	24	8	16	3,582	2,796 84
1,238 16	123 17	23 81	24	8	16	3,146	2,882 64
1,529 28	145 89	23 81	24	8	16	3,978	3,571 48
1,084 06	115 87	27 20	24	8	17	3,077	2,724 63
1,261 50	127 89	23 64	25	8	17	3,144	2,538 03
1,434 95	89 52	21 78	.....	8	17	3,353	1,546 25
1,210 77	48 46	23 16	.....	8	17	3,015	1,282 39
$15,318 43	$1,040 63	$344 26	.....	.....	.....	48,364	$30,405 82

TABLE A—Continued.

Monthly Statement of Work Done in the Street Cleaning Depart-

Month Ending.	District No. 4. Superintendent.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	Edw'd F. Callahan.	194	4,255	2,797	.....
Feb. 28..	" "	173	3,915	11,960	$1,467 50
Mar. 31..	" "	228	5,225	4,017	2,085 00
April 30..	" "	321	3,742	1,915	1,680 00
May 31..	" "	877	2,966	2,407	2,085 00
June 30..	" "	842	1,556	1,980	1,675 00
July 31..	" "	1,145	1,142	1,798	1,702 50
Aug. 31..	" "	1,659	1,184	2,322	2,125 00
Sept. 30..	" "	1,209	1,014	1,645	1,697 50
Oct. 31..	" "	794	1,249	1,885	1,205 00
Nov. 30..	" "	629	1,571	2,234	*.....
Dec. 31..	" "	256	1,822	2,475	*.....
Total for 4th District.....		8,327	29,641	37,435	$15,722 50

*Garbage collected and removed by contract from October 20.

TABLE A—Continued.

ment, with the Cost of Same, in Each Separate District for the Year 1902.

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$1,567 50	$ 31 92	$27 00	.....	13	23	7,246	$1,626 42
2,078 88	.....	24 30	28	13	23	16,048	3,570 68
2,165 83	127 34	55 41	28	13	23	9,470	4,433 58
1,788 92	203 94	19 63	28	13	23	5,978	3,692 49.
2,199 80	307 60	24 75	28	13	24	6,250	4,617 15
1,869 83	268 34	26 54	28	13	24	4,378	3,839 71
1,885 48	292 57	23 81	29	13	25	4,085	3,904 36
2,335 91	353 30	23 81	29	13	25	5,165	4,838 02
1,665 48	289 93	22 70	29	13	24	3,868	3,675 61
1,868 49	261 34	23 64	29	13	24	3,928	3,358 47
2,079 32	258 02	21 78	.....	13	24	4,434	2,359 12
2,032 49	140 73	18 66	.....	13	24	4,553	2,191 88
$23,537 93	$2,535 03	$312 03	.....	.....	.....	75,403	$42,107 49

TABLE A—Continued.

Monthly Statement of Work Done in the Street Cleaning Depart-

Month Ending.	District No. 5. Superintendent.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	John E. Gist.....	551	4,268	1,917	.....
Feb. 29..	" "	459	4,018	10,082	$1,470 00
Mar. 31..	" "	583	5,039	2,668	2,100 00
April 30..	" "	591	3,477	1,743	1,680 00
May 31..	" "	1,332	3,287	2,067	2,090 00
June 30..	" "	1,265	1,448	1,583	1,680 00
July 31..	" "	1,753	840	1,548	1,680 00
Aug. 31..	" "	2,336	914	1,907	2,115 00
Sept. 30..	" "	1,781	806	1,382	1,740 00
Oct. 31..	" "	1,131	990	1,735	1,305 00
Nov. 30..	" "	628	1,559	2,551	* .....
Dec. 31...	" "	257	1,822	2,515	* .....
Total for 5th District.....		12,667	28,468	31,698	$15,860 00

*Garbage collected and removed by contract from October 20.

TABLE A—Continued.

ment, with the Cost of Same, in Each Separate District for the Year 1902.

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$1,571 95	$ 86 04	$21 50	.....	14	20	6,736	$1,679 49
2,108 15	6 68	24 30	28	14	20	14,559	3,609 13
2,082 48	139 46	44 41	28	14	21	8,290	4,366 35
1,813 40	217 17	20 13	28	14	21	5,811	3,730 70
2,289 35	335 49	19 75	28	14	21	6,686	4,734 59
1,885 67	275 39	26 56	28	14	22	4,296	3,867 62
1,900 84	281 10	28 81	28	14	22	4,141	3,890 75
2,316 14	346 61	23 81	28	14	22	5,157	4,801 56
1,771 63	288 99	27 70	29	14	22	3,969	3,828 32
1,928 68	270 94	23 64	29	14	23	3,856	3,528 26
2,374 50	303 12	32 72	.....	15	23	4,738	2,710 34
2,007 17	142 91	18 66	.....	15	23	4,594	2,168 74
$24,049 96	$2,693 90	$311 99	.....	.....	.....	72,833	$42,915 85

TABLE A—Continued.

Monthly Statement of Work Done in the Street Cleaning Depart-

Month Ending.	District No. 6. Superintendent.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	Jos. A. Carey	264	2,747	2,802	.....
Feb. 28..	" " "	265	2,944	11,418	$1,230 00
Mar. 31..	" " "	430	3,818	4,449	1,775 00
Apr. 30..	" " "	528	2,527	2,606	1,420 00
May 31..	" " "	1,144	2,287	3,463	1,730 00
June 30..	" " "	1,044	1,453	2,812	1,320 00
July 31..	" " "	1,098	1,116	2,869	1,300 00
Aug. 31..	" " "	1,609	1,326	3,729	1,665 00
Sept. 30..	" " "	1,251	1,061	2,104	1,315 00
Oct 31..	Michael Doonan ...	1,024	981	1,756	1,005 00
Nov. 30..	" " ...	629	1,575	2,166	* .....
Dec. 31..	" " ...	257	1,828	2,197	* .....
Total for 6th District.....		9,543	23,663	42,371	$12,760 00

*Garbage collected and removed by contract from October 20,

TABLE A—Continued.

ment, with the Cost of Same, in Each Separate District for the Year 1902.

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$2,681 86	$304 64	$50 95	.....	23	34	5,813	$3,037 45
3,417 02	15 41	65 12	24	23	34	14,627	4,727 55
3,704 25	329 95	95 40	24	23	34	8,697	5,904 60
2,949 98	507 49	51 79	24	23	35	5,661	4,929 26
3,778 44	760 22	46 44	23	23	36	6,894	6,315 10
3,107 66	647 37	63 94	23	23	37	5,309	5,138 97
3,171 31	638 60	62 12	22	24	37	5,083	5,172 03
3,913 73	808 07	61 36	22	24	37	6,664	6,448 16
2,769 01	617 99	53 89	23	24	37	4,416	4,755 89
2,939 84	617 97	60 07	23	24	39	3,761	4,622 88
3,928 67	720 02	51 57	.....	25	38	4,370	4,700 26
3,355 64	437 54	43 86	.....	25	38	4,282	3,837 04
$39,717 41	$6,405 27	$706 51	.....	.....	.....	75,577	$59,589 19

TABLE A—Continued.

Monthly Statement of Work Done in the Street Cleaning Depart-

Month Ending.	District No. 7. Superintendent.	Total No. Loads of Garbage Collected and Removed.	Total No. Loads of Ashes Collected and Removed.	Total No. Loads of Street Dirt, Sand, Snow, etc., Collected and Removed.	Cost of Collecting and Removing Ashes and Garbage.
Jan. 31..	Jesse F. Hall.....	284	3,071	2,085	.....
Feb. 28..	" "	228	2,875	10,871	$1,257 50
Mar. 31..	" "	311	3,724	3,451	1,787 00
April 30..	" "	315	2,728	2,338	1,440 00
May 31..	" "	1,027	2,273	2,901	1,800 00
June 30..	" "	1,362	937	2,243	1,500 00
July 31..	" "	1,581	539	2,238	1,492 50
Aug. 31..	" "	2,319	595	2,687	1,875 00
Sept. 30..	" "	1,619	555	1,952	1,500 00
Oct. 31..	" "	1,189	768	2,298	1,125 00
Nov. 30..	" "	629	1,568	2,766	*.....
Dec. 31..	" "	257	1,819	2,347	*.....
Total for 7th District.....		11,121	21,452	38,177	$13,777 00

*Garbage collected and removed by contract from October 20.

TABLE A—Concluded.

ment, with the Cost of Same, in Each Separate District for the Year 1902.

Cost of Collecting and Removing Street Dirt, Sand, Snow, etc.	Amount Expended for Sweeping Machines, Sprinklers and Repairs.	Amount Expended for Tools, etc.	No. of Garbage Carts and Men Employed.	No. of Street Carts and Men Employed.	No. of Sweepers and Scrapers Empl'yed	Total No. of Loads of all Kinds Removed.	Total Amount Expended.
$1,852 55	$ 79 27	$21 50	.....	15	23	5,440	$1,953 32
2,408 01	.....	24 27	25	15	23	13,974	3,689 78
2,466 90	114 29	44 91	24	15	23	7,486	4,413 10
1,942 29	271 19	19 63	24	15	24	5,381	3,673 11
2,579 07	425 17	19 75	24	15	23	6,201	4,823 99
2,010 00	414 41	26 56	24	15	23	4,542	3,950 97
1,976 51	421 19	23 81	24	15	23	4,358	3,914 01
2,398 10	542 28	23 81	24	15	23	5,601	4,839 19
1,737 98	453 28	22 70	24	15	23	4,126	3,713 96
2,060 00	428 14	28 46	25	15	23	4,255	3,641 60
2,498 04	387 57	27 72	.....	15	23	4,963	2,913 33
2,166 00	208 62	42 66	....	16	24	4,423	2,417 28
$26,095 45	$3,745 41	$325 78	.....	.....	.....	70,750	$43,943 64

TABLE B.

REPORT OF WORK DONE, INCLUDING ALL EXPENDITURES IN THE STREET CLEANING DEPARTMENT FOR EACH MONTH OF THE YEAR ENDING DECEMBER 31, 1902, ALSO AMOUNT OF RECEIPTS FROM THE SALES OF REFUSE, Etc.

1902. Month.	Total No. of Loads of Garbage Removed.	Total No. of Loads of Ashes Removed.	Total No. of Loads of Street Dirt, Sand, Snow, Ice, etc., Removed.	Cost of Collecting and Removing Ashes and Garbage.	Cost of Collecting and Removing Street Dirt, Sand, Snow, Ice, etc.	Contingent Fund.	Cost of Sweeping Machines, Sprinklers, Repairs, etc.	Salaries.	Cost of Tools, Repairs, etc.	Cost of Printing.	Cost of Cleaning Sewers and Inlets, Including Tools.	Total No. of Loads Removed from Sewers and Inlets.	Total No. of Loads of all kinds Removed.	Total Amount of Expenditures.	Total Amount of Money Received and paid to Comptroller.
January	2,373	24,012	13,745	$11,398 18	$11,553 64	$58 72	.....	$1,349 97	$191 28	.....	$527 71	105	40,430	$25,085 50	$ 29 75
February	2,190	24,043	56,434	10,869 71	14,736 53	49 50	.....	1,349 97	417 95	11 00	588 90	108	82,667	28,023 56	1 00
March	3,043	30,006	20,427	14,069 10	15,572 93	69 65	$1,550 67	1,350 06	200 95	.....	671 84	149	53,476	33,485 20	38 50
April	3,139	21,194	12,779	12,359 50	12,803 91	53 87	1,716 50	1,349 97	184 23	36 00	495 89	140	37,412	29,045 12	59 60
May	7,090	19,242	16,098	14,890 14	16,228 03	63 80	2,351 31	1,349 97	199 50	.....	791 85	150	42,430	35,829 35	169 75
June	7,858	9,929	12,993	13,062 14	13,512 74	59 00	2,682 19	1,345 87	233 84	7 00	1,026 93	442	30,780	31,939 71	55 25
July	9,190	6,551	12,496	12,347 14	13,515 89	56 47	2,529 77	1,349 97	216 00	17 00	813 05	510	28,237	30,835 29	76 00
August	13,097	6,918	15,725	15,056 89	16,545 80	81 00	2,785 14	1,349 97	210 22	.....	1,201 51	498	35,740	30,969 38	51 50
September	9,668	5,843	10,656	12,437 15	11,807 46	50 65	2,563 58	1,350 06	205 60	.....	800 01	390	26,147	35,475 66	116 80
October	7,175	6,664	11,871	10,112 15	13,251 27	55 12	3,433 26	1,349 97	212 78	.....	636 29	301	25,713	29,050 84	152 70
November	4,383	10,840	14,463	10,526 61	16,116 88	57 00	2,436 41	1,349 97	205 13	.....	761 85	314	29,686	31,453 85	30 00
December	1,801	12,507	13,927	10,871 29	13,975 96	95 20	501 17	1,350 06	203 88	.....	734 13	470	28,235	27,731 69	9 00
													3,607		
Total	71,007	177,749	211,597	$148,000 00	$169,621 04	$749 98	$22,550 00	$16,195 81	$2,687 36	$71 00	$9,049 96	3,607	463,960	$368,925 15	$789 85

TABLE C.

FINANCIAL STATEMENT OF DEPARTMENT OF STREET CLEANING APPROPRIATION FROM JANUARY 1ST, 1902, TO DECEMBER 31ST, 1902.

	Amount of Appropriations.	Expended from January 1, 1902, to December 31, 1902.	Credit Balances December 31, 1902.	Revenue from Sale of Refuse, etc.
Removal of garbage	$148,000 00	$148,000 00		
Street carts and men	85,416 00	85,354 50	$ 61 50	
Sweepers and scrapers	84,286 59	84,266 54	20 05	
Sweeping machines, sprinklers, etc	22,550 00	22,550 00		
Tools and repairs	2,687 41	2,687 36	05	
Contingent fund	750 00	749 98	02	
Salaries	16,200 00	16,195 81	4 19	
Printing	100 00	71 00	29 00	
Cleaning sewers and inlets, including tools	9,050 00	9,049 96	04	
Total	$369,040 00	$368,925 15	$114 85	$789 85

Total amount of appropriation for the year 1902	$369,040 00
Total amount of appropriation expended	368,925 15
Unexpended balance	$114 85
Revenue from sale of refuse, etc	789 85
Total transferred to City Register	$904 70

TABLE D.

Summary.

Total number of loads of garbage collected and removed for 1902		71,007
Total number of loads of ashes collected and removed for 1902		177,749
Total number of loads of street dirt, sand, snow and ice removed for 1902		211,597
Total number of loads of refuse from sewers		3,607
Total of all kinds removed, Jan. 1 to Dec. 31, 1902		463,960
Total amount paid for collecting and removing garbage and ashes for year 1902	$148,000 00	
Total amount paid for collecting and removing street dirt, snow, ice, etc., for year 1902	169,621 04	
Total amount paid for salaries for year 1902	16,195 81	
Total amount paid for sprinkling and sweeping by machines for year 1902	22,550 00	
Total amount paid for tools, repairs, etc., for year 1902	2,687 36	
Total amount paid for contingent fund for year 1902	749 98	
Total amount paid for printing for year 1902	71 00	
Total amount paid for cleaning sewers and inlets, including tools, for year 1902	9,049 96	
Total amount paid for year from Jan. 1 to Dec. 31, 1902.	$368,925 15	
Total amount received for sale of refuse for year 1902	$789 85	
Total number of garbage carts employed to Oct. 20, 1902	175	men.
Total number of street carts employed for year 1902	90	"
Total number of sweepers and scrapers employed for year 1902.	160	"
Total	250	"

Note—Garbage and ashes collected by contract from October 20, 1902.

TABLE E.

NUMBER OF DEAD ANIMALS, ETC., REMOVED IN THE EASTERN AND WESTERN DISTRICTS FROM JANUARY 1 TO DECEMBER 31, 1902.

	Eastern District.	Western District.	Total.
Dogs	1,839	1,640	3,479
Cats	5,423	6,130	11,553
Rats	2,441	2,385	4,826
Fowls	704	661	1,365
Goats	32	19	51
Sheep	6	7	13
Rabbits	47	41	88
Hogs	1	2	3
Deer	.....	1	1
Crabs (pounds)	219	110	429
Decayed Meat (pounds)	295	227	522
Decayed Fish (pounds)	387	436	823

Total number animals removed	20,014
" " fowls "	1,365
" " pounds crabs removed	429
" " " decayed meat removed	522
" " " " fish "	823

TABLE F.

SHOWING THE AMOUNT OF ANIMAL AND VEGETABLE GARBAGE DELIVERED TO CONTRACTOR AT DUMPS NOS. 1 AND 2.

1902. Months.	Dump No. 1, Caroline Street.	Number of Loads.	Dump No. 2, Spring Gardens.	Number of Loads.	Total for Nos. 1 and 2.
January	Jos. W. Funk, Superintendent	445	Hugh Noon, Superintendent	796	1,241
February	" " "	302	" " "	685	987
March	" " "	655	" " "	977	1,632
April	" " "	979	" " "	1,145	2,124
May	" " "	2,708	" " "	3,227	5,935
June	" " "	2,672	" " "	3,437	6,109
July	" " "	2,830	" " "	4,560	7,390
August	" " "	4,338	" " "	6,331	10,669
September	" " "	3,000	" " "	4,594	7,594
October	" " "	2,664	" " "	2,897	5,561
November	" " "	2,158	" " "	1,660	3,818
December	" " "	956	" " "	671	1,627
Total		23,707		30,980	54,687

EIGHTH ANNUAL REPORT

—— OF THE ——

FREE PUBLIC BATH COMMISSION

—— TO THE ——

MAYOR AND CITY COUNCIL OF BALTIMORE,

—— FOR THE ——

Fiscal Year Ending December 31, 1902.

BALTIMORE:
JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

Free Public Bath Commission of Baltimore.

APPOINTED MAY 18TH, 1900.

PRESIDENT,

EUGENE LEVERING.

VICE-PRESIDENT AND TREASURER,

WILLIAM H. MORRISS.

SUPERINTENDENT AND SECRETARY,

REV. THOMAS M. BEADENKOFF.

MARY SHERWOOD, M. D. JOSEPH E. GICHNER, M. D.
JOHN S. FULTON, M. D. GEORGE W. CORNER, JR.
MORRIS A. SOPER.

STANDING COMMITTEES.

Indoor Baths—Walters' No. 1,

G. W. CORNER, JR. MARY SHERWOOD, M. D.
MORRIS A. SOPER.

Indoor Baths—Walters' No. 2,

J. E. GICHNER, M. D. MARY SHERWOOD, M. D.
JOHN D. FULTON, M. D.

Outdoor Baths,

Gwynn's Falls—J. E. GICHNER, M. D.
Winans' Beach—J. S. FULTON, M. D.; G. W. CORNER, JR.
Canton—MORRIS A. SOPER.

The President and Vice-President are ex-officio members of all Committees.

TREASURER'S ANNUAL STATEMENT

FOR 1902.

Receipts from Bath House No. 1, January to December 31	$2,845 86	
Laundry	263 39	
		$3,109 25
Receipts from Bath No. 2, April to December 31	$1,081 64	
Laundry	44 21	
		1,125 85
Receipts from Outdoor Baths June, July, August, September		568 08
Total receipts		$4,803 18
Salaries No. 1	$3,663 00	
Expenses No. 1	2,392 10	
		$6,055 10
Salaries No. 2	$2,721 09	
Expenses No. 2	1,522 98	
		4,272 95
Salaries Outdoor Baths	$ 776 22	
Expenses Outdoor Baths	1,638 61	
		2,414 83
		$12,742 88
Superintendent		499 92
Total expenses		$13,242 80

ANNUAL REPORT

OF THE

Free Public Bath Commission.

1902.

Hon. Thomas G. Hayes,

Mayor of the City of Baltimore.

Dear Sir:—The Free Public Bath Commission respectfully report on the work committed to them for the year past as follows:

Net Expenditure and Patronage.

The net expenditure of this Commission for the year has been $8,410. With this amount the Commission has maintained two bath houses, open every day and evening, and four bath houses open during the summer. The total number of persons availing themselves of the opportunity afforded was 207,893.

New Bath Opened.

In April of 1902 Bath No. 2, on Columbia avenue and Callendar alley, was opened to the public. This bath house cost $27,000 and was the gift of Mr. Henry Walters. From the opening day until the last day of December the patronage was most gratifying, and there is no question in the

minds of the Commissioners that the right site was selected for this second municipal bath. The record of attendance is as follows:

	Bath.	Laundry.
April	3,671	0
May	5,180	2
June	6,263	14
July	7,488	40
August	6,689	51
September	3,556	44
October	2,764	61
November	3,180	84
December	2,206	133
	40,997	429

There is every reason to believe that this bath house will increase in popularity and usefulness as the days go by and the facilities offered become better known.

AT BATH NO. 1.

For another full year the splendid work of this bath has been continued. Every month shows increase over the corresponding month of the year before, as the following table will show:

	1901.		1902.	
	Baths.	Laundry.	Baths.	Laundry.
January	2,729	243	4,250	326
February	2,805	340	4,162	334
March	4,259	293	7,059	246
April	4,946	220	8,167	141
May	6,711	225	11,690	171
June	11,991	197	14,321	156
July	10,817	198	17,088	206
August	9,384	175	14,182	145
September	6,257	133	9,360	183
October	3,954	144	7,794	175
November	3,584	166	7,259	221
December	3,668	282	5,843	323
	71,105	2,616	111,175	2,627

In this connection we desire to refer to our former communication relative to the enlargement of this bath house. In that communication we were led to urge the necessity for doubling the capacity of this bath house. For the sum of $15,000 such an addition could be made upon the lot on the rear of the present bath house owned by the city as should enable us to double the service rendered. The neighborhood is so thickly settled, and the patronage of the present bath so encouraging, that we believe the expenditure of this amount is almost a necessity.

NO. 3 BATH.

During the year Mr. Henry Walters made it known, by a letter to the chairman of your Commission, that he was willing to erect a third bath house at a cost approximately the same as that of each of the other bath houses, viz., $25,000. This bath house to be erected in such a neighborhood as the Commissioners should consider most needy. This gift was duly reported to the Mayor, and the proper ordinance sent by him to the City Council. The Council has already taken steps to accept this gift, and will, no doubt, agree that the city shall maintain the same, as in the case of the other baths before erected.

Your commission has decided upon the most desirable place for this bath house, and as soon as a suitable lot can be secured plans will be prepared, and the bath when completed will be known as Walters Bath No. 3.

The generous action of Mr. Henry Walters in thus furnishing another public bath house seems to your Commissioners to call for the hearty thanks of the entire community, as by this gift he has not only greatly benefited Baltimore, but has set an example to the public spirited citizens of other cities.

School Children.

In our last annual report we called attention to the fact that a special rate of one cent had been granted to school children on Saturdays, and also reported that our action had resulted in bringing a large number of such children to use the baths on the day mentioned. Since that time it has become evident that a still larger use of the baths would be promoted if the co-operation of the School Board could be secured. In accordance with this a letter was addressed to the School Board offering to give *free* baths to any children sent by their teachers at any time. The hope was entertained that in this way the children attending school from homes where bathing facilities are limited might be sent by their teacher to the public baths. It is hardly necessary to say that the School Board entered heartily into the plan, and children can now be sent by their teachers at any time and receive, without cost, the privileges of the public baths.

At the Outdoor Baths.

The new bath house at Winans' Beach proved even more attractive this year than last. At Canton and at Gwynn's Falls the same story could be told of increased attendance and appreciation. The attendance at these outdoor baths was as follows:

	1901.	1902.
Winan's Beach	23,799	26,379
Gwynn's Falls	12,375	13,239
Canton	15,035	12,280
Locust Point	.....	767
Total	51,209	52,665

All three of the shores were improved before the season began, and quite extensive improvements were made at Gwynn's Falls, so that the drainage from above was carried off below the bathing station and the pool left clean and admirably adapted for its purpose.

Women's Baths.

For the first time in the history of the Commission an attempt was made to establish a bathing station out of doors for women and girls. This bath was opened at Locust Point with very meagre equipment, but the result was altogether gratifying, the attendance during the twenty-eight days the bath was open being 767. We are glad to report that by reason of the additional appropriation granted by the Mayor and City Council we shall undertake this work upon a more extensive scale this summer.

Water Front Necessary.

In this connection the Commissioners beg to call the attention of the Mayor and City Council to the great desirability of securing by purchase some of the available water front of the city for public use. Only a few places in the city now remain where an outdoor bath could be operated, and these places, unless secured, will soon be taken by the extending commerce of a rapidly growing city. Once gone it will be almost impossible to secure it again, and the great mass of people who cannot go out of town in the summer will thus be deprived of this healthful means of recreation. As the city increases in population the need of outdoor public baths will become more and more pressing, and we cannot urge too strongly the importance of proper action to save some of the water front for the people.

Financial Summary.

Expenditures.	1901.	1902.
Superintendent		$499 92
Bath No. 1.		
Wages	$3,370 56	3,663 00
Maintenance	2,323 13	2,392 10
Bath No. 2.		
Wages	not open.	2,721 09
Maintenance	" "	1,522 93

Outdoor Baths.

Wages	$ 753 82	$ 776 22
Maintenance	1,616 96	1,638 61
	$8,064 47	$13,213 92
Receipts	2,906 46	4,803 18
Net cost to the city	$5,158 01	$8,410 74

Summary of Attendance.

	1901.	1902.
Bath No. 1	73,221	113,802
Bath No. 2	not open.	41,426
Outdoor Baths	51,209	52,665
	124,430	207,838

General Summary.

The Commission has enjoyed the services of Rev. Thomas M. Beadenkoff during the entire year. He has brought to his position unbounded enthusiasm and accurate knowledge, and the success of the public baths this year is largely due to his untiring effort and painstaking work.

The Commission has received a number of letters of inquiry from other cities in reference to the baths, and committees from various places have visited Baltimore to inspect our equipment. All inquiries have been carefully answered and visitors given every facility to learn the details, both of equipment and operation. Some of the Commissioners have visited other cities to inspect the baths there in operation, but there is no question that Baltimore, while not having the largest baths, has the best, both in equipment and service.

The thanks of the Commission are due to the various officials of the city for uniform courtesy, and especially to the police department for unremitting attention at our outdoor baths during the summer season.

Respectfully submitted.

EUGENE LEVERING,

President.

ANNUAL REPORT

OF THE

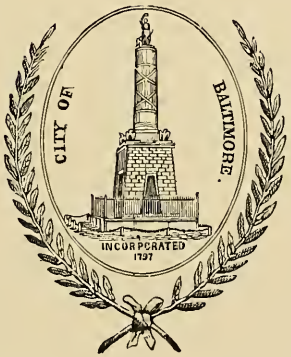
Collector of Water Rents and Licenses

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ending December 31, 1902.



BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

REPORT.

Department of Finance,

Sub-Department, Collector of Water Rents and Licenses.

Baltimore, Md., January 1, 1903.

To the Honorable the Mayor and Members of the City Council:

Gentlemen: I herewith submit a report of the work of this Sub-Department for the year ending December 31, 1902.

The number of water takers during the year 1902 was 100,151, an increase of 1,301 over the year 1901.

The collections made of water rents, plumbing bills, etc., amounted to $860,440.88, and were less than those of 1901 by $100,167.69. This loss was occasioned by the reduction of water rents by the passage of ordinance No. 135, approved May 13, 1901.

From these collections $1,014.30 were returned by errors caused by mistakes in statements of property owners and allowances for vacancies.

Again it is a pleasure to me to commend the faithfulness of the employes in this Department, and to note their unfailing efforts to serve the people courteously and quickly.

The total receipts for licenses amounted to $78,618.47.

The accompanying tabulated statements set forth in detail the work done:

A.—Collections of Water Rents.

B.—Expenditures.

C.—Monthly Receipts of Water Rents.

D.—Abatements.

E.—New Supplies and Ferrules Returned.

F.—Balances Remaining on Ledgers December 31, 1902.

G.—Revenue shown by Ledgers January 1, 1903.

H.—Receipts for Licenses.

All of which is respectfully submitted.

CARLTON SHAFER,
Collector of Water Rents and Licenses.

STATEMENT A.

Collections Made for Water Department During the Year 1902.

		DR.	CR.
To Water Rents for 1902	$377,522 75		
Less discount	14,373 41		
		$363,149 34	
To Water Rents for 1901		182,729 04	
" " 1900		3,773 89	
" " 1899		1,647 24	
" Meter Rents		264,283 06	
" Interest on back Water Rents		4,245 51	
" Plumbing bills		28,871 42	
" Meter plumbing		9,522 38	
" Vacancies		364 00	
" Turn-offs		1,855 00	
By Deposits with City Register:			
January			$158,709 47
February			167,901 16
March			57,215 19
April			111,928 91
May			90,384 17
June			43,544 22
July			76,505 36
August			12,110 81
September			13,400 12
October			78,377 48
November			12,219 01
December			38,144 98
		$860,440 88	$860,440 88

STATEMENT B.

Expenditures During the Year 1902.

Appropriation made by Mayor and City Council:		
For expenses, including $380,000 for interest on water loans	$382,300 00	
For salaries	22,600 00	
		$404,900 00
Amount expended for expenses	$381,331 19	
" " salaries	22,483 62	
		403,814 81
Amount unexpended and included in surplus turned over to Finance Commissioners by Water Engineer		$1,085 19

STATEMENT D.

Abatements Condensed for the Year 1902.

	No.	Delinquent.	Current.	Total.
January	208	$ 637 90	$ 558 08	$1,195 98
February	296	823 30	669 85	1,493 15
March	244	649 86	492 67	1,142 53
April	220	564 56	419 42	983 98
May	452	1,827 77	986 05	2,813 82
June	411	1,428 10	1,002 25	2,430 35
July	218	544 93	446 08	991 01
August	142	430 00	373 82	803 82
September	237	238 43	346 33	584 76
October	216	440 09	537 72	977 81
November	204	136 50	322 59	459 09
December	233	243 18	596 28	839 46
Total	3,081	$7,964 62	$6,751 14	$14,715 76

STATEMENT C.

RECEIPTS OF THE COLLECTOR OF WATER RENTS AND LICENSES FROM WATER RENTS FOR THE YEAR 1902.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Water rents for 1902	$70,707 90	$146,864 05	$34,189 60	$19,668 74	$15,295 67	$14,146 79	$8,146 76	$5,737 35	$6,086 91	$7,441 50	$6,675 91	$28,188 16	$363,149 34
Water rents for 1901	24,912 66	17,497 79	16,557 59	31,308 49	66,637 59	20,988 32	1,946 70	939 83	635 00	583 74	252 09	469 24	182,729 04
Water rents for 1900	486 26	241 40	294 67	343 09	999 34	807 98	233 08	140 42	79 50	52 65	24 00	71 50	3,773 89
Water rents for 1899	94 50	52 50	15 50	204 25	261 16	291 08	119 75	211 00	69 00	132 50	89 00	107 00	1,647 24
Meter rents	60,321 59	1,356 20	2,561 21	56,477 61	1,263 55	1,598 06	62,154 28	1,196 80	3,087 17	66,686 54	2,088 22	5,491 83	264,283 06
Plumbing bills	1,284 46	1,276 43	1,969 32	2,561 94	2,494 29	2,671 62	2,392 95	3,349 57	2,960 04	2,838 26	2,567 40	2,505 14	28,871 42
Meter plumbing	647 36	371 66	1,323 24	651 59	727 95	1,520 85	1,310 99	399 49	399 18	545 32	446 97	1,177 78	9,522 38
Interest on back water rents	168 74	196 13	271 06	677 20	1,800 62	743 52	107 85	84 35	51 32	52 97	33 42	58 33	4,245 51
Turn offs	36 00	9 00	10 00	22 00	845 00	739 00	68 00	45 00	25 00	27 00	12 00	17 00	1,855 00
Vacancies	50 00	36 00	23 00	14 00	59 00	37 00	25 00	7 00	7 00	17 00	30 00	59 00	364 00
	$158,709 47	$167,901 16	$57,215 19	$111,928 91	$90,384 17	$43,544 22	$76,505 36	$12,110 81	$13,400 12	$78,377 48	$12,219 01	$38,144 98	$860,440 88

STATEMENT E.

New Supplies and Ferrules Returned for the Year 1902.

1,217 new supplies at $12		$14,604 00
58 " " 8		464 00
137 " " 6		822 00
639 joint supplies 6		3,834 00
67 Ferrules returned at $2		134 00
Total		$19,858 00

STATEMENT F.

Balances Remaining on Ledgers December 31, 1902.

Current water rents	$147,867 11
Delinquent water rents	3,440 71
Meter rates	221 17
Plumbing bills	3,914 05
Total	$155,443 04

STATEMENT G.

Revenue Shown by Ledgers January 1, 1903.

100,151 houses, yielding a revenue of	$511,320 00
Estimated revenue from meters and indicators	270,000 00
Total	$781,320 00

STATEMENT H.

Receipts from General Licenses for the Year 1902.

Wagons, one-horse	$17,553 20
" two-horse	10,970 15
" three-horse	472 00
" four and more horse	472 90
Carts	3,756 30
Drays	145 70
Hacks	576 95
Cabs	203 25
Cars	2,740 00
Package carts	809 90
Scows	465 70
Bacon	950 00
Sausage and pudding	206 25
Telegraph poles	14,728 00
Foreign fruit	250 35
Billiard, bagatelle and pool tables	2,092 90
Coal oil	838 60
Theatrical permits and licenses	2,326 50
Bowling alleys	408 30
Pawnbrokers	1,000 00
Privies	429 05
Merchandise (women)	102 12
Numbers replaced	64 50
	$61,562 62
Received for dog licenses	17,055 85
Total receipts	$78,618 47

REPORT

——OF THE——

TOPOGRAPHICAL SURVEY COMMISSION

——TO THE——

Mayor and City Council of Baltimore

——FOR THE——

Fiscal Year Ended December 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

Mayor's Office,
Baltimore, Md., February 6, 1903.

To the Honorable, the Mayor and City Council of Baltimore:

The Topographical Survey Commission would respectfully submit the following report of the Chief Engineer of the Topographical Survey, which is full and satisfactory.

Very respectfully,

[Signed] Thomas G. Hayes, *Mayor*,
Jas. H. Smith, *Comptroller*,
Geo. N. Numsen, *Register*,
Topographical Survey Commission.

REPORT

— OF THE —

CHIEF ENGINEER

— TO THE —

Topographical Survey Commission

FOR THE YEAR 1902.

City of Baltimore Topographical Survey.

BALTIMORE, December 31, 1902.

To the HON. THOMAS G. HAYES, *Mayor*,
HON. JAMES H. SMITH, *Comptroller*,
HON. GEORGE N. NUMSEN, *Register*,
Topographical Survey Commission:

GENTLEMEN—I have the honor to submit the following report of the work done by this Department during the year 1902, together with such observations and suggestions as the experience gained during this period makes pertinent.

STREET PROJECTION WORK.

In conformity with the general plan of work laid down for this Department, the extension of the proposed system of streets for the Annex has steadily progressed.

Very little work was necessary in locating the stones and other field marks required in the work of projecting streets in the western part of the Annex north of Baltimore street, as this work was practically completed last year. About thirty stones were located in the Montebello tract, in connection with the traverse work done there.

It is not necessary to go into details concerning these points, as they were fully discussed in last year's report.

The information accumulated in the field and gathered from other sources has been carefully gone over and put into practical shape; it is now available for direct use in the field in locating street corners, giving lines of streets, and doing other similar work. In order to make this information as easily accessible as possible, it was systematized and entered in a series of books especially reserved for this purpose. Each street intersection in the Annex, so far as worked up,

has been carefully plotted to scale; it is accompanied by all the data necessary to immediately effect an accurate location of all the points and lines in the field. By this means the plan in view is carried into effect, namely, to have all the final field work in thorough harmony with the system planned and inaugurated by the Topographical Survey Commission.

To give an approximate idea of the extent of this work, it may be stated that it has been estimated that about twenty-four hundred (2,400) street intersections, street bends and angles will have to be thus worked up. A complete cross index will facilitate the finding of any point desired.

In addition to being compiled in book form, the matter just referred to has been entered upon sheets covering one square mile each, and drawn to a scale of two hundred feet to one inch, thus agreeing with the general map of the city in scale and execution. Of the ten square miles of these sheets now under way five have been practically completed. All new matter is entered as soon as possible.

The practical utility of this work has been fully demonstrated by the demands made upon it by the various City Departments, professional engineers and the public generally.

CARE OF SURVEY POINTS.

Before leaving this part of my report, I would again respectfully call attention to the great need of properly protecting all points and other marks forming a part of the system of this Survey. At present there is no law or ordinance in existence or in contemplation which covers this case. The importance of the matter is certainly great enough to merit the fullest attention.

The Police Department responded most willingly to our request for points likely to prove dangerous to pedestrians, and complaints from this source have become much less frequent in consequence.

SPECIAL WORK DONE.

In addition to the work done on the general plan of streets for the Annex, the following plats were made by this office; in several cases the plats were accompanied by detailed descriptions:

(*a*) Preliminary plat for the closing of Oliver street from the north side of North avenue to the points of tangency it forms with the circular street around Mount Royal reservoir.

(*b*) Plat for the closing of Elm street from the north side of North avenue to the property line of the Northern Central Railway Company.

(*c*) Plat for the opening of a 30-foot street running from the north side of North avenue tangentially to the 30-foot circular street around Mount Royal reservoir.

(*d*) Plat for the closing of a 20-foot alley running from the west side of Elm street southwesterly toward the northwest corner of Oliver street and North avenue, and bounding the "Grasshopper Hill" property on the north.

(*e*) Plat for the opening of York road from North avenue to the northern boundary line of the city.

(*f*) Plat for the opening of Ostend street from the west side of Race street westerly, and of Stockholm street from the east side of Leadenhall street easterly, until they intersect.

(*g*) Plat for the opening of Thirty-third street from the east side of Charles street to the east side of Hillen road.

All of the material for the foregoing work was furnished by this office from data in its possession.

A drawing of the Baltimore Harbor, showing the channels and general depths, was made for the Municipal Statistician and published in his Monthly Bulletin for May, 1902.

The work of copying the record books of traverse and other points was begun in the early fall and is now nearing its completion. After properly checking these copies they will be deposited for safe-keeping in the vaults of the City Hall.

At various times this Department was called upon by the City Engineering Departments for information. It has proved peculiarly serviceable to the Municipal Law Department, writing for it descriptions of property, doing drafting work and making special surveys. Among the latter may be mentioned a survey made of the Gwynn's Falls Park property, and in connection therewith the definite laying out in the field of Eleventh street, from Edmondson avenue to Fayette street.

The latent desire of some of our progressive citizens to enhance the natural beauties of Baltimore by a proper cultivation of its advantages has received a marked stimulus by the Municipal Art Society. A powerful incentive in this direction was given by the munificent gift to the Johns Hopkins University of Homewood Park and the acquisition by the City of Wyman Park. By the conjoint action of the university and the Municipal Art Society the problem of developing this property was entrusted to the able firm of Olmsted Brothers, landscape architects, of Boston.

In order to facilitate the work now in progress on these properties, the Topographical Survey Commission was called upon to lend its fullest aid. In response to this call this Department made a topographical survey of the proposed division line between the city property of Wyman Park and the Johns Hopkins University grounds, and about two hundred feet on either side of this line, thus covering an estimated area of about sixty-five acres. In this survey elevations were shown by two-foot contour intervals, and every tree found within this area and having a diameter of twelve inches and over was accurately defined by name, location, elevation and diameter. This work was drawn to a scale of forty feet to one inch.

Subsequently a revision was made of this line; this necessitated a complete reworking of all its mathematieal elements in order to permit its being staked out in the field.

It is a source of pleasure to state here that throughout the progress of this work this department has received the most flattering expressions of appreciation on the part of Messrs. Olmsted and all others interested.

Attention has been for some time directed to the improvement of the western portion of our city, and the rapid development of property in and around Walbrook has quickened this attention into an interest which now demands serious consideration. In preparing the General Plan of Streets for the Annex it was found that the region along the Gwynn's Falls seriously interfered with the regularity of the system of streets planned for that region. The difficulties encountered were often so great as to become insurmountable from engineering and financial standpoints. A thorough study of the situation resulted in the conviction that the best way to solve the problem would be to convert the valley of the Gwynn's Falls, about the length of two miles, into a park. This idea has met with general satisfaction, and, to give it tangible shape, an extended plan has been prepared in this office. A reproduction of this plan is attached to this report.

The plan to transform Gwynn's Falls into a park has many features to commend it. It would be difficult to find elsewhere so many elements which go to the making up of a true park compressed within the narrow confines of the territory considered. The visitor to that place will at once be impressed with the fact that he is in the presence of no ordinary scenery, and that for wild and rugged beauty, primeval forest growth, running water, valleys and secluded nooks, this region challenges comparison. Even Druid Hill Park, which has so long enjoyed a national reputation for natural beauty, and has helped to make Baltimore famous, has in this park a worthy rival.

The proposed site of Gwynn's Falls Valley Park, and a considerable portion of the territory contiguous to it, is comparatively worthless for building purposes. It would be

rendered even more so by being stripped of its timber, as it would then be simply converted into a barren waste. A notable example of this shortsighted policy is now to be met with in that same locality. Being thus without any value for purposes of building, this land might be made to serve as an enhancer of values for outlying properties, which it certainly would do if it were in the form of a public park. Wise policy should dictate that an effort be made to acquire this property for the city, by donation or otherwise, while it is still cheap and easily obtained. To further this project was one of the objects of the accompanying map.

In this plan the streets running northerly and easterly were extended southward and westward, respectively, in the directions originally laid down on the general plan of streets for the Annex until brought to the edge of the valley of the falls. Here they merge with a proposed driveway following the eastern edge of the valley on the high ground. By this means as much of the property susceptible of development was left outside of the park area.

On the west side of the Falls and north of Edmondson avenue the streets shown follow a plan already laid down. They are continued northerly and easterly until they terminate in a driveway running along the western edge of the valley in a way similar to the driveway on the eastern edge.

The Franklin road running along the bed of the valley is destined to become an important thoroughfare in the near future, as it is one of the city's main highways leading to the country. It is proposed to widen this road, so as to satisfy the new conditions.

It is also proposed to make connections from the driveways with the road, thus making the one side of the valley directly accessible to the other, and likewise saving the cost of expensive bridges.

The eastern driveway has an elevation above the stream of from one hundred to one hundred and fifty feet and an approximate length of two and seven-tenths (2.7) miles.

The western driveway has an elevation of from one hundred to one hundred and twenty-five feet above the Falls, and an estimated length of three and two-tenths (3.2) miles. Between driveways the valley is in some places from seven hundred to twelve hundred feet across, and from all points of the driveway most imposing views of the valley are obtained. It may be remarked that the length of driveway given, namely 5.9 miles, is likewise the extent of park frontage available for building purposes. The area of the proposed park is about 210 acres.

It will be seen from the plat that the proposed Gwynn's Falls Valley Park practically forms a continuation of the present Gwynn's Falls Park, being separated from it only by Edmondson avenue.

RECOMMENDATIONS.

As a fitting sequel to the amendment to the City Charter, mentioned under the head of "Review," as having been passed, the following rules are submitted for consideration:

RULES GOVERNING APPLICATIONS TO SUB-DIVIDE LAND IN THE CITY OF BALTIMORE.

Applications to Sub-divide.

SECTION 1. Applications for the approval of sub-divisions laid out for public use and for the purpose of deeding or dedicating to the City of Baltimore the beds of avenues, streets and alleys contained therein, must be made to the Topographical Survey Commission, and must be accompanied by—

(*a.*) Plats in duplicate showing the proposed sub-division, which plats must be signed by the owners of the land sub-divided and their signatures witnessed by two witnesses.

(*b.*) Affidavit by persons executing sub-divisions that they are the owners in fee-simple of the property sub-divided; that no other person has any interest or claim therein; that they are in peaceful occupation thereof, and that there are no suits or actions pending affecting the title to said property.

(*c.*) Certificates of the proper officials that all taxes, special assessments and other public charges upon the property have been paid.

Survey and Location of Sub-divisions.

SEC. 2. No sub-division of land will be received for record unless the plat conforms to the following requirements and the sub-division is marked on the ground as hereinafter described—

(*a.*) All plats must be drawn with India ink on tracing cloth cut to one of the following standard sizes, viz., 28 by 40 inches, or 20 by 28 inches. A plain black border shall be drawn around the plat two inches from the edge of the sheet, with sufficient space left inside of the border for notes of approval and filing.

(*b.*) The original tract to be sub-divided shall be plainly indicated as to location and boundaries and its total acreage given.

(*c.*) The true bearings, based upon the Topographical Survey Standard Meridian, of the boundary lines shall be given in degrees, minutes and seconds, and their lengths in feet and decimal parts of a foot.

(*d.*) The true bearings, based upon the Topographical Survey Standard Meridian, of all streets and alleys shall be given in degrees, minutes and seconds, and the width of every street and alley in feet and decimal parts of a foot. Wherever a street line intersects a boundary line, the distance shall be given to one of the boundary corners.

(*e.*) The dimensions of every block shall be given.

(*f.*) The sub-division, before it is allowed to go on record, shall be marked on the ground with stone monuments placed at every boundary corner. These monuments shall have square tops from four to six inches a side, be sunk in the ground not less than two feet and project above the ground not less than three inches.

(*g.*) The bearings and distances of all lines of connection between the said monuments as planted and of all street and alley lines, as shown on the plat, must be verified and checked by the Chief Engineer of the Topographical Survey.

Approval of Sub-divisions.

SEC. 3. Sub-divisions must receive the approval of the Topographical Survey Commission and must be laid out so as to conform generally to the the general Plan of Streets for the Annex, as approved under Ordinance 129 and dated December 3, 1898, before being admitted to record. When sub-division plats are so approved they shall become the property of the City of Baltimore, and one copy shall be filed and recorded in the office of the Topographical Survey and one copy forwarded with the application to the Mayor for his approval, and upon which approval said copy will then be recorded in the office of the City Comptroller.

The recommendation is again made, and its earnest and prompt consideration urgently advocated, to pass an ordinance requiring all persons who desire to build, before the permit is granted, to first submit to the Chief Engineer of the Topographical Survey in duplicate a plat of convenient size and scale showing in outline the lot or lots as situated relative to the adjacent highways, the ground plan of the proposed building or buildings, and their relative position and other necessary information. If the plat so submitted meet with the necessary requirements, the Chief Engineer of the Topographical Survey will approve the plat and retain one copy; the other copy, together with the application, will be submitted to the Inspector of Buildings by the party making the application .

The value of this information to the city was sufficiently touched upon in my report of last year.

It is further recommended that an ordinance be passed requiring the Mayor and City Council of Baltimore, before receiving a deed to any piece of property within the corporate limits of the city, whether for park, street, building or other purpose, to have the said property surveyed by the Topographical Survey and a plat of the same prepared in duplicate, one copy of which is to be filed with the deed, and the other to be deposited with the City Librarian.

In addition to the foregoing, it is recommended that the Mayor and City Council be required to have surveys made by the Topographical Survey of all properties now held in the name of the Mayor and City Council, and that plats of these surveys be deposited with the City Librarian.

The method heretofore employed for making surveys of property either already in possession of the city, or to be acquired by it, has been one involving more or less of uncertainty. An examination of these surveys will réveal the fact that in the majority of cases they are entirely isolated, having no organic interconnection, and devoid of any element which might be regarded as a satisfactory check upon the

accuracy of the work. One of the results of this way of doing things was the possible encroachment upon the property rights of others and the consequent legal complications. Another result was the frequent impossibility of co-ordinating the survey with existing measurements in the field.

This condition of affairs was to a great extent excusable, as up to the advent of the methods introduced by the Topographical Survey there existed no means by which a survey could be made to fit into a general system without great expense. These means are now at hand, and the above ordinance has in view a uniform system of surveys of public properties based upon the general system of the Topographical Survey. This has been a want long felt by the city, and especially by the Municipal Law Department.

During the past year numerous requests have been received by this office for the report made by Col. H. T. Douglas as Chief Engineer to the Topographical Survey Commission in 1894. This report is now out of print and the supply for distribution has long been exhausted. In view of the fact that this report is replete with matter of the greatest interest to all engaged in topographic work, and has become an object of great desire the more its merits are known, it is suggested that it be republished. But as certain portions of the said report have at this day lost their original import, it is further suggested that the new report be so modified as to leave out these unessential parts, and to have substituted certain others which would make the public better acquainted with the working methods and aims of this survey.

The estimated cost of this undertaking is about five hundred dollars ($500.00), a sum small compared with the results sure to be realized. This work, moreover, would be in keeping with the character of the survey, and would reflect greatly to the advantage of the city as a pioneer in this as well as in other matters.

REVIEW.

Upon the recommendation in last year's report the following amendment to the City Charter, Chapter 840, was passed by the General Assembly of Maryland, and approved April 8, 1902:

CHAPTER 453.

An act to repeal Code, Section 840, of the Act of 1898, Chapter 123, known as the "City Charter," and re-enact the same with amendment.

SECTION 1. Be it enacted by the General Assembly of Maryland, That Code, Section 840, of the Acts of 1898, Chapter 125, known as the "City Charter," be and the same is hereby repealed and re-enacted with amendments, so as to read as follows:

SEC. 840. No avenues, streets or alleys within the territory annexed to the City of Baltimore by the Act of 1888, Chapter 98, shall hereafter be opened, established or condemned, nor shall the dedication of any avenue, street or alley hereafter be made in said territory be accepted by the Mayor and City Council of Baltimore, unless the lines and grades of said avenues, streets or alleys be opened, established, condemned or dedicated to conform to the general plan of streets for the Annex, as adopted under Ordinance No. 129, approved December 3, 1898; such avenues, streets and alleys must have first received the approval of the Topographical Survey Commission, and have been reported by the said Commission to the Mayor and City Council: said Topographical Survey Commission is hereby authorized to make, subject to the approval of the Mayor and City Council, such rules and regulations regarding surveys, plats or plans relating to the location of avenues, streets and alleys as they deem proper, from time to time.

Approved April 8, 1902.

By the above Act the city is now authorized to make such changes in the general plan of streets for the Annex as may be found necessary.

The ordinance introduced in the Second Branch of the City Council on June 10, 1901, entitled "An ordinance to repeal Section 3 of Article 49, Baltimore City Code, 1893, and to re-enact the same with amendments," is still in the hands of the Ways and Means Committee.

The purpose of this ordinance is to empower the Commissioners for Opening Streets to call upon this Department for any information required by them; also to have condemnation and other plats prepared in this office for the opening of streets in the Annex. Such information is to have the same legal value as if furnished by the City Surveyor.

That this Ordinance has been thus unnecessarily delayed is to be greatly regretted. The benefits to be derived by the city by the passage of this Ordinance are so very great that any further loss of time is inexcusable.

I wish to direct attention, at this place, to the importance of keeping the general map of the city up to date. It must be remembered that this map was completed several years ago, and that it represents conditions which then existed. Since then many changes and improvements have been made in the city's topography, but any records relating to these, if at all in existence, are of difficult access to the general public. This gap in the city's records is often very painfully felt, and to fill it means an expenditure of time and money which might have been avoided. In order, therefore, to make the city ever ready to respond to calls for information as to its topography, it cannot be too strongly urged to adopt the recommendations previously made in this report.

As the city is growing at a very rapid rate, any loss of time in attending to this matter would materially increase the cost of collecting and arranging this information and might seriously affect some future interests. I therefore again urge prompt consideration.

It is again a source of pleasure to have to state that this Survey is daily receiving a greater amount of attention, and this not only from those at home but also from those from more distant points. Thus the Thayer School of Civil Engineering at Hanover, New Hampshire, inquired into the methods of work pursued here. Unfortunately, the request for one of Col. Douglas' reports could not be satisfied, but sufficient other material was sent in the way of drawings and descriptions to give a fair idea of the work done here.

The Topographical Bureau of the Board of Public Improvements, and the Department of Docks and Ferries, both of New York City, also made requests for reports.

During the summer this office was visited by Mr. Louis L. Tribus, Commissioner of Public Works, Borough of Richmond, New York, who has charge of the Topographical Survey of Staten Island, now in progress. This gentleman was very much interested in the work done here, and made extended notes and inquiries.

The attitude assumed toward the Topographical Survey by the local engineering concerns has become most friendly. It might as well be said here that this office is always ready to assist everyone interested with advice and other information pertaining to the work now in progress. It is better equipped with data relating to the survey and topography of Baltimore than is generally known. In connection with this subject, it might also be mentioned that a number of projects relating to the improvement of the city have been either worked out in this office or have been looked into. Some of these projects were originated by the Survey, but have been accredited to other sources. This activity has placed this office in a position to offer valuable advice or suggestions to owners who contemplate making improvements in their property.

I have to record the following changes in the personnel of this office: Mr. Charles M. Wilkinson resigned his position as recorder and computer in October to accept a position with the Western Maryland Railroad. In Mr. Wilkinson the Survey has lost a very capable and efficient worker.

The vacancy caused by the resignation of Mr. Wilkinson was filled by the appointment of Mr. Montague Blundon, a graduate of the Virginia Military Institute.

RECEIPTS AND EXPENDITURES.

I beg herewith to make a statement of the receipts and expenditures of this Department for the fiscal year ending December 31, 1902:

RECEIPTS.

(Appropriation for 1902.)

For salaries	$5,940 00	
For expenses	180 00	
From sale of maps, etc	106 25	
		$6,226 25

EXPENSES.

For salaries	$5,880 80	
For expenses	141 43	
		$6,022 23

BALANCE.

Unexpended salaries	$ 59 20	
Unexpended expenses	38 57	
Receipts from sale of maps, etc	106 25	
		$ 204 02

In conclusion, I wish to thank the various City Departments and other parties for their co-operation, and for the confidence reposed by them in the work of this office.

Those associated with me during the past year justly deserve mention for the interest shown by them in the work of this Department and for the very thorough manner in which they executed their various portions of the work.

Very respectfully submitted,

JOS. W. SHIRLEY,
Chief Engineer.

ANNUAL REPORT

OF THE

SUPERINTENDENT PUBLIC BUILDINGS

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ending December 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

REPORT.

OFFICE OF SUPERINTENDENT PUBLIC BUILDINGS,

CITY HALL, BALTIMORE, January 1, 1903.

To the Honorable the Mayor
and City Council of Baltimore.

GENTLEMEN :

Pursuant to law, I herewith submit my annual report of the operations of the Department of Superintendent of Public Buildings for the past year.

While no material changes have been made in the buildings proper under my supervision, I have endeavored, by repolishing, cleaning and furnishing, to add to the comfort and convenience of the various departments of the city government and the preservation of its property.

CITY HALL.

The Hall during the year just closed was improved by fresh coats of paint applied to the corridors, rotunda and a number of the rooms. Many other rooms are badly in need of painting or frescoing, and I would recommend that this be done at an early date, for appearance sake as well as for the preservation of the building.

The Mayor's Reception Room, the Council Chambers, City Library and other rooms have been greatly improved in

appearance by the repolishing of the marble pillars, woodwork and furniture, which had become dirty and dull by the effect of time.

When my last report was sent in, the work of installing a motor and plant for running the City Hall elevator by electricity was in progress. This work was completed early in the year, since which time the elevator has been propelled by power from the city's electric plant at the Court House, used in conjunction with the original water power, the result being a far more satisfactory and rapid service, which has met with much favorable comment.

During the year the following Departments have been improved with new carpets, linoleums, etc.: City Comptroller's Offices, City Register's Offices, Assistant Engineer of Water Board, Harbor Board, City Library and Librarian's Office, Appeal Tax Court, City Engineer's Office, Inspector of Buildings' Offices, and others.

A new room has been provided for the meetings of Boards by partitioning off the west end of the corridor on the second floor of the Hall. The same has been furnished, and serves as very convenient and comfortable quarters for the several Boards which meet there.

The work of the City Engineer's Department, which occupies a number of rooms, has been facilitated by the recent installation of an improved local telephone system.

In view of the lack of room in the Hall to accommodate all of the various departments of the city government, I beg to repeat the following recommendation made in my last annual report:

"I would again respectfully call your attention to the overcrowded condition of the City Hall. The city has outgrown its executive building. We are now renting, at an expense of eighteen hundred dollars per year, an old school building on Gay street, which is being used as an annex, to

accommodate the departments for which there is no room in the Hall. Though the building is not suited for the purpose, its use is compulsory for lack of room elsewhere.

"It is evident, therefore, that our City Hall, which for a number of years after its erection met all requirements, is too small to accommodate the various departments necessary in the conduct of the official business of Baltimore of today.

"I would therefore recommend that the city build a suitable annex to the Hall, and would suggest as a location the northeast corner of Lexington and Holliday streets, a part of which is now unimproved. Such a building might be advantageously used by the Health, Fire, Water and other Departments and the Central Police Station as well."

CITY HALL ANNEX.

This building, used by the Health Department and its several branches, the Quarantine and Bay View Offices, is, as I have stated, by no means an attractive or creditable public building. Nevertheless, I have endeavored to make it as comfortable and convenient for the transaction of business as the circumstances will permit, and have added during the year various necessary furniture, cases, floor coverings, additional lights, etc. This Department has also during the past year supplied necessary furniture and carpets to the Quarantine Hospital, at an expense of about $700.

COURT HOUSE.

It is a pleasure to be able to report the general condition of this magnificent building good. The polishing of the walls and finished mahogany wood work has been looked well after during the year by men provided for and familiar with such work, thereby retaining in them, to a very large degree, the same cleanliness and lustre as when new.

The four elevators in the building, and the electrical machinery by which they are run, have been overhauled

during the year and are in first-class condition. The batteries of the electric plant which supplies light and power for the Court House and City Hall have also been overhauled and new plates supplied where needed.

I desire to again call your attention to the necessity of duplicate engines and boilers in this building. Should there be a breakdown of the machinery of the plant, which is likely to occur at any time, there would be no reserve engine or boiler, and the result would be serious. As I stated in my report a year ago, the electrical plant, installed for the use of the Court House alone, is supplying light and power for the City Hall as well, and, as a result, is being overtaxed. This fact renders all the more urgent the necessity for duplicate engines and boilers.

The batteries and wiring for an improved system of electric clocks throughout the building have been installed, and early in the present year the clocks will be placed in the several Departments and Courts. The master clock of the system is already in position in the Police Department. These clocks will be such as will correspond with the finishings of the courts and rooms in which they will be placed.

During the year the Art Commission has added to the beauty and interest of the Court House by decorating the walls of the eastern court corridor on the first floor, and in the Court of Common Pleas on the second floor, with historic mural paintings.

The formerly abandoned court room opposite the St. Paul street entrance was furnished during the year and occupied by the Juvenile Court, which holds daily sessions therein.

The rooms of the Courts presided over by Judges Dennis and Sharp and the Court-at-Large have been furnished with new draperies, linoleums, rugs, etc., adding much to their comfort and appearance. New and necessary furniture has also been placed in the offices of the Board of Police Commissioners, and other rooms of the building where needed.

I have endeavored to look well after the needs of the buildings in my charge, and while recognizing the fact that many improvements are necessary in the way of new furniture, carpetings, etc., I have supplied such needs as rapidly as the means at my command would permit.

Trusting that this report will meet with your approbation, I have the honor to be

Very truly yours,

FREDERICK T. HELLMANN,
Superintendent Public Buildings.

ANNUAL REPORT

OF THE

CITY LIBRARIAN,

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ending December 31, 1902.

BALTIMORE :
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

REPORT.

City Library—City Hall,

Baltimore, January 2, 1903.

To the Honorable the Mayor and City Council of Baltimore:

Gentlemen: Another fiscal year having closed on December 31, 1902, I herewith respectfully submit the report of the City Library for that time.

During the year just passed this Department has had erected metallic cases for the filing of the original ordinances and resolutions of the city, thus guaranteeing their safe-keeping and preservation.

The various reports, journals, ordinances and resolutions published by the city for distribution, etc., have been supplied to the proper departments and officials entitled thereto. Numerous requests for City Charters, Codes, Reports of Electrical and Sewerage Commissions, from various parts of our country have been received and promptly complied with.

The total number distributed is as follows: Annual Reports, 28; City Charters, 50; City Codes, 12; Electrical Commission Reports, 9; Journals (City Council), 67; Ordinances and Resolutions, 94; Sewerage Commission Reports, 30.

The City Librarian also acknowledges, with thanks, the receipt of municipal and departmental reports issued by—National: United States Commissioners of Education, 1899-

1900, Vol. 2. States: Commissioner of Insurance, New York; Maryland Reports, Nos. 92, 93 and 94. Municipalities: Boston, Mass., Charleston, S. C., Chicago, Ill., Cincinnati, O., Detroit, Mich., Hartford, Conn., Providence, R. I., Savannah, Ga., St. Louis, Mo. Miscellaneous: Architects' Magazine, Popular Mechanics, Sunset.

Very respectfully, etc.,

S. H. RANDALL,

Librarian.

STATEMENT—CLASS A.

SHOWING THE AMOUNTS EXPENDED FOR THE VARIOUS DEPARTMENTS FOR 1902.

DEPARTMENTS.	Stationery.	Printing.	Books.	Total.
Appeal Tax Court	$ 78 31	$ 116 95	$137 56	$ 332 82
Baltimore City Jail	126 06	79 92	75 15	281 13
Board of Estimates	9 00	.....	.....	9 00
City Collector	166 03	508 35	583 35	1,257 73
" Comptroller	38 81	56 50	85 47	180 78
" Engineer	185 84	150 87	119 55	456 26
" Library	43 86	19 20	35 83	98 89
" Register	34 81	41 75	250 63	327 19
" Solicitor	41 97	21 45	.....	63 42
Collector of Water Rents and Licenses	.....	66 60	.....	66 60
Commissioners of Opening Streets	50 28	3 10	1 80	55 18
Commissioner of Street Cleaning	45 01	35 50	20 54	101 05
Fire	127 90	406 78	164 40	699 08
Health	525 27	1,054 20	760 35	2,339 82
Harbor Board	20 03	18 00	9 70	47 73
" Masters	51	13 75	.....	14 26
Inspector of Buildings	47 20	295 85	146 41	489 46
Juvenile Court	17 65	.....	.....	17 65
Mayoralty	32 06	42 15	13 70	87 91
School Commissioners	.....	1,497 43	482 70	1,980 13
Supervisors of City Charities	105 46	255 83	144 20	505 49
Superintendent of Lamps and Lighting	75 42	38 57	52 66	166 65
Superintendent of Public Buildings	13 55	14 25	19 60	47 40
Topographical Survey	69 85	1 13	10 05	81 03
	$1,854 88	$4,738 13	$3,113 65	$9,706 66

CLASS D.

Amount Expended for Other Departments.

Board of Finance	$ 121 00	
City Register	6 00	
Collector of Water Rents and Licenses	664 60	
Commissioners of Free Baths	58 00	
Commissioner of Street Cleaning	60 00	
Electrical Commission	240 32	
Fire	428 00	
Inspector of Buildings	47 75	
Municipal Statistician	532 22	
Parks and Squares	277 77	
Superintendent Lamps and Lighting	73 25	
Topographical Survey	32 50	
Water	1,451 08	
Mayoralty	65 00	
		$4,057 49

STATEMENT—CLASS B.

City Library Expense Account.

Advertising	$ 37 92	
Metalic cases	158 33	
Postage	17 25	
		$ 213 50

STATEMENT—CLASS C.

City Library Salary Account.

Librarian's salary	$1,500 00	
First assistant's salary	900 00	
Second assistant's salary	750 00	
		$ 3,150 00

Summary.

Total expenditures—Class A	$9,706 66	
Total expenditures—Class B	213 50	
Balance to Sinking Fund	4,849 73	
		$14,769 89
Amount appropriated for stationery, printing and books for the various departments		14,769 89
Total expenditures—Class C	$3,150 00	
		$3,150 00
Amount appropriated for salaries of City Library.		3,150 00
Cash receipts for year		$52 50

FORTY-THIRD ANNUAL REPORT

OF THE

Commissioners for Opening Streets

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ending December 31, 1902.

BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

REPORT.

OFFICE OF THE COMMISSIONERS FOR OPENING STREETS,

BALTIMORE, January 1, 1903.

To the Honorable the Mayor and City Council of Baltimore:

GENTLEMEN:

We have the honor to submit to you a statement of the operations of this Department from January 1, 1902, to December 31, 1902, inclusive.

The following list comprises the streets, alleys, etc., condemned, opened and closed during the above-stated time; also the amount of damages, expenses and benefits, and amount assessed to the Mayor and City Council for each and every street, etc.

STREETS OPENED AND CLOSED.

Names of Streets.	No. Ord.	Approved.	Damages.	Expenses.	Benefits.	Waivers.	Amount on City.
Opened.							
Jackson st., from Fort ave. to Wells st.....	7	Nov. 1, 1901	$12,426 13	$710 05	$6,019 53	$4,047 47	$7,116 65
Aiken st., from Lanvale st. to North ave.....	26	Jan. 29, 1902	3,613 33	595 94	3,106 80	.....	1,102 47
Viaduct ave., from north side Twenty-eighth st. to south side of Cedar ave.; also Twenty-eighth st., about 23.07 feet in width and 66 feet in depth, lying southwest of the southwest line of Mt. Vernon ave., as laid down on the Topographical Survey of the city..	57	May 19, 1902	4,838 30	891 24	1,221 97	.....	4,507 57
Closed.							
Jenkins lane, between North ave. and Twentieth st.; Point lane, between North ave. and Twentieth st., and Jenkins lane, between Twentieth st. and Cromwell st.....	126	May 2, 1901	40 00	450 68	490 68	....	.....
Totals	.....	.....	$20,917 76	$2,647 91	$10,838 98	$4,047 47	$12,726 69

STREETS, ALLEYS, Etc., IN PROCESS OF OPENING.

Names of Streets.	No. Ord.	Approved.
*Morton alley, from John street to Hoffman street.	96	May 25, 1882
*Henry street, from Clement street to Fifth lane...	77	May 14, 1885
*Elizabeth lane, from Randall street to Heath street	54	May 2, 1888
*Dallas street, from Oliver street to Hoffman street.	115	Oct. 16, 1888
*Rope Walk lane, from Randall street to Heath street	36	April 26, 1889
*Towson street, from Fort avenue to Marriott street	70	May 23, 1889
*Florence street, from Fulton avenue to Retreat street	99	June 8, 1889
*Francis street, from Retreat street to Whitelock street	101	June 8, 1889
*Morris alley, from North avenue to Druid Hill Park	103	June 8, 1889
Stoddard alley, from Mosher street to McMechen street	148	Oct. 9, 1889
*Nicholson street, from Decatur street to Cooksie street	161	Oct. 28, 1889
Ridgely street, from Ostend street to Gwynn's Falls	77	May 8, 1891
*An alley 10 feet wide, from Second street to First street	111	June 4, 1891
*Neighbor street, from McKim street to Greenmount avenue	106	May 28, 1894
An alley 15 feet wide, from Gold street to Bloom street	23	Mar. 6, 1893
*Windsor avenue, from North avenue to Clifton avenue	26	Mar. 20, 1894
*Canton avenue, from Cannon street to Luzerne street	67	May 15, 1895
*Wolfe street, from North avenue to Clifton Park..	112	Nov. 11, 1898
*An alley 10 feet wide, from Orleans street to Jefferson street, between Central avenue and Eden street	29	April 5, 1898
*An alley 9 feet 9 inches wide, from Monument street to an alley 10 feet wide, between Caroline street and Spring street	29	April 5, 1898
*An alley 10 feet wide, from the south side of Madison street to an alley 10 feet wide, between Caroline street and Spring street	29	April 5, 1898
*An alley 10 feet wide, from the north side of Madison street to the south side of Chew street, between Caroline street and Dallas street	29	April 5, 1898
Abell street, from the north side of Thirty-first street, or Waverly avenue, to the southwest side of Merryman's lane	69	June 10, 1902

*Recommended for repeal.

STREETS, ALLEYS, Etc., IN PROCESS OF CLOSING.

Names of Streets.	No. Ord.	Approved.
Point lane, from Ensor street to North avenue.....	84	May 23, 1882
*Valley, from Barre street to Welcome alley.....	91	Oct. 8, 1885
Butchers' lane, from Calhoun street to North avenue	61	May 2, 1888
*Fourth lane, from Hanover street to Light street..	22	Mar. 29, 1889
*Brown's lane, from Eden street to Caroline street..	111	June 10, 1889
Clifton Place, from Truxton street to Eager street..	111	Oct. 17, 1892
Grove street, from Truxton street to Eager street...	111	Oct. 17, 1892
Truxton street, from Forrest street to Concord street	111	Oct. 17, 1892
Half Moon alley, from west of Chestnut street.....	99	May 25, 1891
*Comet street, from a 10-foot alley to a fence corner there situated	103	May 27, 1891
*An alley, 33 feet wide, from York road to about 138 feet south of Huntingdon avenue.....	25	Mar. 6, 1893
*An alley, from Madison street to an alley 10 feet wide, between Eden street and Spring street.....	29	April 5, 1898
West Falls lane, from Wells street to a point 85 feet 7 inches southerly.....	88	June 7, 1899
Apple or Jew alley, from the south side of Monument street to the north side of the Old Joppa road.....	99	Nov. 24, 1902

*Recommended for repeal.

F. E. BOND,
HENRY YEWELL,
ARTHUR R. MACLELLAN,
Commissioners.

George Chesley, *Clerk.*

ANNUAL REPORT

— OF THE —

CITY ENGINEER

— TO THE —

MAYOR AND CITY COUNCIL OF BALTIMORE,

— FOR THE —

Fiscal Year Ending December 31, 1902.

BALTIMORE:
JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

OFFICERS

OF THE

CITY ENGINEER'S DEPARTMENT.

B. T. FENDALL.....City Engineer.
J. EARLY WALSH.....Chief Clerk.
JAMES R. DUNLOP.....Permit Clerk.
JOSEPH S. CLARKE.....Bookkeeper.
F. HARRY DEANE.....Stenographer.
FRANCIS CUTAIR.....Pole Inspector.
D. A. FENTON.....Inspector.
ALFRED HALLYDAY.....Inspector.
WILLIAM T. GARRETT.....Inspector.

O. W. CONNET.....Assistant City Engineer.
JAMES A. PAIGE.....Assistant Engineer.
FRANK K. DUNCAN.....Assistant Engineer.
THOMAS C. HARRIS.....Draughtsman.
E. F. RODGERS.....Clerk.
JOSEPH B. MAGUIRE.....Footway Inspector.

NEWTON M. GRAY.....Assistant City Engineer.
B. LATROBE WESTON.....Assistant Engineer.
RUEL K. COMPTON.....Assistant Engineer.
HENRY F. SIEMERS.....Draughtsman.
J. J. O'LEARY.....Superintendent.

JOHN S. PATTERSON.....Assistant City Engineer.
JOHN S. DOYLE.....Assistant Engineer.
JOSEPH L. WICKES.....Assistant Engineer.
WILLIAM SMART.....Clerk.
W. W. STOCKHAM.....Paving Inspector.
CHARLES A. HEIL.....Sup't City Yard.
JOHN F. IRETON.....Ass't City Yard.

INSTRUCTIONS TO FOREMEN AND OTHER EMPLOYEES.

1. Foremen must be on the ground not later than 7.45 a. m. in order that the work may begin promptly at 8 o'clock.

2. Eight hours constitutes a day's work, and each man will be allowed only for the actual time worked.

3. The hours for every working day will be from 8 o'clock a. m. until 5 o'clock p. m., with one hour, 12 o'clock noon to 1 o'clock p. m. for dinner. On Saturdays the hours may be from 7 a. m. to 4 p. m.

4. Gangs must not be worked overtime when it can be avoided.

5. Foremen must not leave the work without permission. If anything is needed report it to the Engineer-in-Charge, his assistants, or send a message to the City Hall. When necessary for foremen or men to be at the City Hall, business must be promptly transacted. They will not be allowed to remain in or about the Hall.

6. Foremen will be held responsible for the amount and character of work done and for the orderly behavior and industry of their men.

7. Foremen must lay out the work for their men and not select a paver to act as boss-paver over the other men.

8. Foremen must not allow mechanics, pavers, rammers or carters to work as laborers except at the wages of a laborer, unless expressly authorized to do so by the Engineer-in-Charge.

9. Work must be planned so as to obstruct travel and the convenience of the public as little as possible. Refuse material must not be allowed to accumulate on the work. Streets must be in safe condition when the force leaves, and the proper lights and guards set.

10. A careful record must be kept of each man's time, with the dates, location, kind of work and all facts necessary to make up correct payrolls and accounts of the work, and reported to the Engineer-in-Charge or his assistants.

11. Foremen must keep a careful record of all tools and materials received and delivered. They will be held responsible for the economical use of materials, and must account for all losses and breakage of tools. All broken or wornout tools must be returned to the property yard.

12. No repaving must be done on rainy days, when the ground is soft and the sand too wet. No time to be allowed on rainy days except for service rendered.

13. It must be the constant effort to have good work done at the least cost to the city.

14. As little time as possible must be lost in moving from one job to another, and foremen must learn in advance where they are to go next.

15. Any employee who shall absent himself from the work without good and sufficient cause will be dismissed and his place filled by another man.

16. Any employee found under the influence of liquor, or using profane and abusive language, negligent, insubordinate, or in any way interfering with or obstructing the work, shall be promptly suspended by the foreman. A written report giving the facts in the case must be immediately transmitted to the Engineer-in-Charge, signed by the foreman.

17. Foremen must not frequent saloons under any pretext whatever during working hours, nor permit anyone under their charge to do so. Anyone not complying with this order will be liable to dismissal.

18. All orders or tickets for material on property yard or on contractors must be written and signed by the foreman.

19. Carts employed on city work must be driven by their owners, as provided by law.

20. Foremen will in all cases make written reports of any accident, of however trifling a nature, that may occur on their work, giving date, names and addresses of witnesses, etc.

21. Any employee on the work who shall solicit contributions of contractors furnishing material, or of any other person, will be dismissed at once.

22. Foremen will be provided with copies of specifications for materials, and must carefully read same, and must accept only material in accordance with said specifications.

23. The use of the city's tools or materials by anyone in doing private work in or out of working hours is strictly forbidden. Any violation of this order will be followed by immediate dismissal.

24. Foremen must carefully read the foregoing rules, familiarize themselves with them, and see that those employed under them also fully understand the rules.

REPORT.

City Engineer's Office,

Baltimore, Md., January 1, 1903.

To the Honorable the Mayor and City Council of Baltimore:

I respectfully submit the following report of the operations of the City Engineer's Department for the year ending December 31st, 1902.

More new work has been done in the past year than for several years previous, the amount of repair work remaining the same.

The following pieces of street paving were authorized by the Board of Estimates, the cost to be taken from the levy of 1902, viz:

Hanover street, from Fort avenue to Winder street, with Belgian blocks; St. Paul street, from North avenue to Twenty-fifth street, with sheet asphalt; North avenue from Greenmount avenue to Broadway, Fulton avenue from Pennsylvania avenue to Druid Hill avenue, Warren avenue from Light street for 1,380 feet east thereof, McCulloh street from Lanvale street to Lafayette avenue, and North avenue from Pennsylvania avenue for 150 feet west, with asphalt blocks.

Bids were invited on these several pieces of work on February 12th, 1902, and they were opened by the Board of Awards February 26th, 1902. These bids were considered too high; upon recommendation they were thrown out by that Board, and the work was re-advertised April 16th, new bids received and contracts awarded.

By this arrangement a saving of $10,167 was effected.

The paving of Hanover street and St. Paul street has been completed; also North avenue, with the exception of the north side from Harford avenue to Broadway, amounting to about one-seventh of the whole amount. All of the streets could easily have been finished during the year had there been no unusual drawbacks, but from start to finish there were a series of annoying delays. The most serious trouble was the inability of the contractor to get blocks. The factory furnishing the blocks installed new and heavier presses, and was delayed by the foundry failing to deliver the new machinery at the time specified. When the presses and machinery arrived, there was more delay in its erection and adjustment, and after everything appeared to be working satisfactorily, there were several serious breaks at the factory causing stoppages of from one day to two weeks at a time. In addition to the foregoing, there was trouble with cement. Several lots of cement delivered by the contractor did not come up to specifications, and were condemned. The cement mills being crowded with orders, it was difficult to get any that would meet our requirements. The weather, by this time, having become quite cold, the work was stopped, as it was not deemed prudent to lay the concrete base in freezing weather. The contractors are in a position to start again early in the spring, and push the new paving vigorously to completion. The following streets were paved by assessment:

*Baltimore street, from Grove street to eastern city limits, sheet asphaltum.

Bayard street, from Columbia avenue to Herkimer street, asphalt blocks.

Chesapeake street, from Fairmount avenue to Fayette street, vitrified bricks.

Baltimore street, from Grove street to Kenwood avenue, was also paved with sheet asphaltum, and the money provided from the contingent fund. The paving of this part

*One-half block from Hare street to Canton street is not completed on account of the construction of Ogier's Run Sewer; it will be finished early in 1903.

of Baltimore street was provided for in the Ordinance of Estimates, 1902, in case there should be a surplus from the amounts set aside for the paving of various other streets already named, but this particular piece was considered so important that it was deemed advisable to take no risks on a possible surplus, but pave at once and get the money from the contingent fund; this was done, and the completion of Baltimore street paving to the eastern city limits was assured.

Two large storm water drains and several small pipe drains have been built during the year. They are, first: Extension of Jenkins' Run under Ordinance No. 125, 1901. This sewer has a circular section with cradle. Diameter, 9 feet 6 inches. It is built of Portland cement concrete with a vitrified brick invert, and is the first sewer or drain of its kind ever built in Baltimore. Concrete work of this character is quite common in other sections of the country, but brick or stone has been used heretofore in Baltimore exclusively. The reasons for the use of concrete construction are: better construction at a greatly reduced cost. Jenkins Run cost the city $16.94 per lineal foot, and is undoubtedly the cheapest sewer of its capacity we have ever constructed. In looking over the accounts giving the cost of sewers prior to 1895, it is impossible to get data for comparison. A sum is named as the total cost of the sewer, and this sum includes excavation, stone and brick work, together with right-of-way and any other expense which might have been incurred. No unit costs being given, a comparison is impossible. Since 1895 there has been a marked improvement. The report on the Brice Alley sewer, built in 1898, gives a very clear statement of the cost per cubic yard of the various classes of work, and from the annual report for the year 1898 we learn that Brice Alley sewer is a brick circle with stone cradle, diameter 9 feet 6 inches, and cost $26.70 per lineal foot, or about 58 per cent. more than Jenkins'

Run, the dimensions being the same in both pieces of work. In estimating on a brick sewer for Jenkins' Run, before deciding on concrete, the conclusion reached was that a 9-foot 6-inch brick sewer with stone cradle could be built for $23.13 per lineal foot. Such a sewer would have been identical with Brice alley, but $3.57 per lineal foot cheaper.

The other large sewer built this year was what is known as the Ogier's Run sewer. It is almost identical with Jenkins' Run, except as to the diameter. The lower part is 9 feet 6 inches (same as Jenkins' Run), and cost $17.42 per lineal foot, or 48 cents per foot more. The upper stretch was 9 feet in diameter and cost $16.17 per lineal foot. This difference in cost is on account of the crushed stone costing more at Ogier's Run than at Jenkins' Run, and the further fact that the Jenkins' Run sewer had only one curve, whereas Ogier's Run had three. All curved work costs more than straight.

Attention is called to the fact that while the sewers just described are the first of their kind built in Baltimore, Schroeder's Run sewer was rebuilt for part of its length in 1900 with a concrete arch. An examination of this work made very recently shows the arch to be in splendid shape, and all that could be desired after more than two years' service. Schroeder's Run had exceptionally hard service, due to the highly polluted condition of the sewage, and the large volume of hot water turned in the sewer from the ice plant. Notwithstanding these adverse circumstances, the arch is a hard, solid monolith showing no signs of disintegration or deterioration of any sort, and is stronger and better today than it was when completed.

Ogier's Run sewer was designed to go as far as Lombard and Patuxent streets, and for the present join with the Harris Creek sewer, but this arrangement is only temporary. When Harris Creek and Ogier's Run basins build up, and streets are graded and paved, the present Harris Creek sewer will be greatly overcharged, and must be relieved entirely of

Ogier's Run. This relief may be had by disconnecting Ogier's Run sewer at Lombard and Patuxent streets, and extending it down Patuxent street to the harbor. This statement is made to explain an apparently absurd plan, viz: the construction of a 9-foot 6-inch sewer for Ogier's Run, and connecting it with a 7-foot branch of Harris Creek sewer at Lombard and Patuxent streets. Let it be understood, therefore, that this is a temporary makeshift to save the expense of very costly construction at this time, but which construction will be necessary in the future. The loss on account of connecting and disconnecting will be insignificant. That portion of Ogier's Run built this year is large enough to take care of future conditions when the basin has been built over and has become a part of a city.

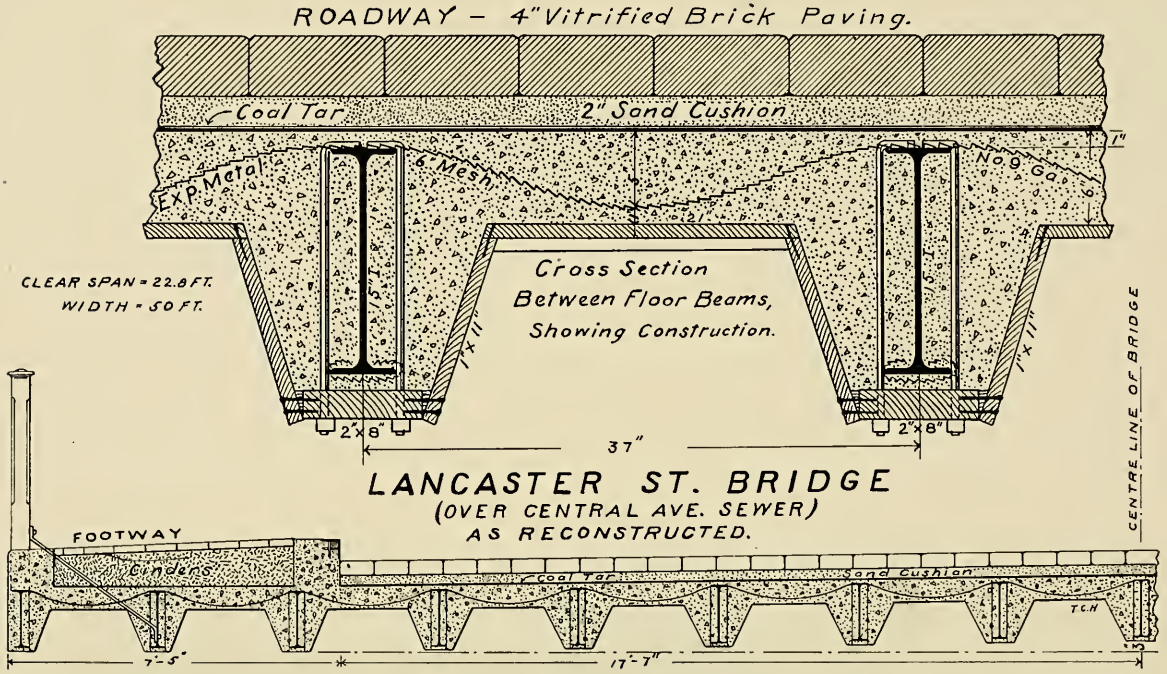
The smaller sewers constructed are the Patuxent street lateral, First and Remington avenue sewer, Cedar avenue lateral, Clement street sewer, Garrett avenue lateral, Druid Hill avenue, Clendenin and Whitelock street sewer. These are all pipe sewers, and there are no special features in connection with them calling for special comment. They were all very necessary to relieve very bad drainage conditions in the several sections contiguous to them, and have been of great benefit.

The usual amount of repair work has been done on the old sewers this year. The largest expenditure was on Central avenue sewer. These repairs were begun in 1900, and are now nearly completed. A number of new inlets were constructed, old ones were repaired and remodeled, and a very large number provided with inlet manholes. The construction of these inlet manholes was begun in 1900, and continued during the succeeding years. They are of the greatest importance in cleaning the inlets and connections, and save a great deal of expense, besides insuring far better service. Their construction will be continued so far as the funds at the disposal of the department will permit.

Full detailed statements as to cost, etc., will be found in the report of Assistant City Engineer Gray, pages 107 to 135. His report gives a very complete statement of all expenditures on sewers, whether new construction or repairs of old work.

The various large bridges in the city have been repaired and painted where necessary. The same care has been exercised in cleaning and scraping the iron work, before applying the paint, as heretofore. The system of replacing temporary wooden structures with permanent stone, or iron, started in 1900, has been continued. The most important and novel piece of work of this character was the use of Ferro-Concrete, or Armored Concrete, on the Lancaster street bridge. This is a bridge over the lower end of Central avenue sewer. Originally it was an iron "I" beam construction, with a wooden floor. The wooden floor was a source of perpetual expense, very unsatisfactory, and more or less dangerous. The diagram on the opposite page illustrates the method of treatment. The iron beams were first well cleaned, then covered with coal tar and surrounded with concrete; the spaces between the beams were filled with a floor of concrete six inches thick, reinforced with six-inch mesh expanded metal; on top of the concrete was placed a coating of coal tar to exclude the moisture, the whole finished with a vitrified brick pavement. From tests made by the department, last summer, on an exactly similar construction, the conclusion was reached that such a floor was strong enough to withstand four times the heaviest load that could ever come upon it.

Considerable saving has been affected in the maintenance of Light street bridge by a slight change in the details of the floor construction, suggested by Mr. Connet. Formally the wheel guard on each side of the bridge was fastened to the floor, close at all points, with no air space between. This arrangement caught and held the dust and dirt, which in turn held the water, and caused the rotting of the floor. The very simple device of a cleat, at intervals, between the top


ROADWAY – 4" Vitrified Brick Paving.
Coal Tar
2" Sand Cushion
1"
Exp. Metal
6 Mesh
No. 9 Ga.
12"
CLEAR SPAN = 22.8 FT.
WIDTH = 50 FT.
Cross Section
Between Floor Beams,
Showing Construction.
7" x 11"
7" x 11"
2" x 8"
2" x 8"
37"
CENTRE LINE OF BRIDGE
LANCASTER ST. BRIDGE
(OVER CENTRAL AVE. SEWER)
AS RECONSTRUCTED.
FOOTWAY
Cinders
Coal Tar
Sand Cushion
T.C.H.
7'-5"
17'-7"

of the floor and the bottom of the rail guard, prevents the dirt from collecting, and allows it to be blown away by the wind; during rains the water runs off rapidly, the danger of rotting the plank flooring is miminized, and the cost of maintaining the floor reduced one-fourth.

The lead pipe for conveying city water under Jones' Falls to the water motors at Block street bridge has been most satisfactory, and has saved expense and given much better service. The work was done last year. See City Engineer's report for 1901, as to cost, etc.

Most of the fund for the repairs of roads and streets was expended on cobble-stone repairs. Of this character of work there was an increase of twelve and seven-tenths per cent., and the cost increased eight-tenths of one per cent. There was also a material increase of the amount of repair work done on improved pavements, and a most satisfactory reduction in cost. The tables in the report of Assistant City Engineer Patterson give this information in detail. His report contains much valuable information concerning amount and cost of general repairs of roads and streets.

Little new work has been done in the streets by the various railway companies during the year. A short siding built by the Northern Central R. R. under authority of Ordinance No. 61, and certain curve connections built by the United Railway and Electric Company under Ordinance No. 44, covers all that has been done in the way of new railway construction during the year.

The Baltimore Refrigerating and Heating Company are constructing their subways and pipe-lines under Ordinance No. 18 of 1901. Owing to the crowded condition of the factories furnishing the various supplies needed by this company, they have been unable to make much progress. They expect to do better in the future.

The Chesapeake & Potomac Telephone Company laid during the year 32,974 feet of ducts for their cables. They have at this time in the city's streets 170,863 feet of ducts, and on private streets and alleys, 10,102 lineal feet of ducts.

The paving over their conduits is restored by the city and the cost of the work is paid by the telephone company.

The Chesapeake Company, as well as the Maryland Company, have erected large numbers of poles during the year under permits from this department. It is unfortunate that there is no way to *check* such construction, but the law only allows the City Engineer to *regulate* such construction. While there are some poles being removed in what is known as the "congested district," the number being erected in other parts of the city is alarming.

The recommendations heretofore made for certain additions to our storm water drains are again submitted, as they appear to be so very important. The drains of this character most needed at present are as follows:

Extension of Centre street sewer from St. Paul street, westward on Centre street to Howard street, north on Howard street to Madison street.

Sewer in East Fayette street, from Montford avenue to connect with the Lakewood avenue sewer, with a lateral in Montford avenue, from Fayette street to Orleans street, thence in Orleans street to Patterson Park avenue, together with a second lateral in Montford avenue from Fayette street to Fairmount avenue.

In order that certain valuable property may be improved and built up, the following improvements are recommended:

The completing of Ogier's Run sewer to the eastern city limits at Fairmount avenue, with the necessary laterals.

The completing of the gap in the sewer now ending at Monroe and Presstman streets, by extending the present construction to a point south of the Baltimore & Potomac Railroad, connecting with an existing sewer in the bed of Payson street. This sewer in the bed of Payson street now

ends at the corner of Smallwood and Franklin streets. It should be extended in Smallwood street to Lexington street, thence in Lexington street to Gwynn's Run.

The construction of a sewer to carry Sumwalt's Run from Hargrove alley and Thirty-second street to a point near Maryland avenue and Twenty-eighth street. This much should be done at once, and the sewer extended north and south as the development of the territory may require. Barclay street sewer should be extended and connect with the Sumwalt's Run sewer.

The construction of a sewer connecting what is known as the Eagle street sewer with Bush street sewer. This sewer lies within the boundaries of Carroll Park, and the completion of the park is impracticable until this sewer is built.

Sewer near the Mount Royal entrance to Druid Hill Park. This sewer will connect with an existing sewer under Mount Royal avenue and extend northwesterly under alleys and streets on the Bond property.

No improved pavements have been recommended. Better pavements are greatly needed, but in view of the fact that a complete sanitary sewage system *must* be constructed in the near future, it would be most unwise to lay good pavements first and in a short time practically destroy them in order to lay the sewers. The attempt which would be made to restore the improved pavement would be very costly, and the result of such an attempt would be a very poor substitute for an originally good pavement.

It is a pleasure to recall the cordial relations existing between this department and the officers and employees of the other departments of the City Government, and I take this occasion to thank these gentlemen for their uniform courtesy, co-operation and support. I also desire to commend my assistants, and the employees of this department generally, for the intelligence, fidelity and zeal with which they have discharged their several duties, and to thank them for loyal support.

B. T. FENDALL,
City Engineer.

GENERAL INFORMATION.

The Total Mileage of Paved Streets in the City of Baltimore, December 31, 1902, is as follows:

Total mileage of paved streets	377.58	miles.
Total mileage of improved streets	53.9	"
Vitrified brick pavement	3.4	miles.
Macadam	.81	"
Asphalt blocks	10.94	"
Sheet asphalt	9.35	"
Belgian block	28.84	"
Wood	.07	"
Mosaic block	.5	"
Cobble stones	323.68	"

Area of the City is as follows:

Land area	30,141	square miles.
Harbor area	1,507	"
Total area	31.648	"

Elevation Above Mean Low Tide.

The highest elevation in the city, is near Garrison and Oxford avenues, West Arlington	461.0	feet.
Elevation of street pavement at the base of Washington Monument	99.3	feet.

Length of City Sewers.

Brick sewers	28.60	miles.
Stone sewers	6.25	"
Concrete	.43	"
Terra cotta pipe sewers	5.63	"
Cast iron pipe sewers	2.88	"
Total	43.79	"

The above does not include the length of sewers owned by private parties.

Statement of Permits Issued by the City Engineer's Department During the Year 1902.

The permits issued during the year number 4,547, an increase of 95 over that of 1901. Classified they are as follows:

To the Consolidated Gas Co., to lay service pipes	698
To the Consolidated Gas Co., to repair service pipes	257
To the Consolidated Gas Co., to lay mains	130
To the Consolidated Gas Co., to repair mains	120
To the Water Department, to open improved streets	47
To the Baltimore County Water and Electric Co., to lay service pipes	2
To the Baltimore County Water and Electric Co., to repair service pipes	4
To the Baltimore County Water and Electric Co., to lay mains	2
To the Baltimore County Water and Electric Co., to repair mains	2
To open footways to lay water supply pipes	491
To open footways to repair water supply pipes	584
To erect, replace, change and renew telegraph poles	12
To erect, replace, change and renew telephone poles	140
To erect, replace, change and renew electric line and lamp poles	103
To erect, replace, change and renew trolley poles	22
To erect, replace, change and renew police and fire alarm poles	2
To erect, replace, change and renew guy poles	8
To erect, replace, change and renew awning, barber and other poles and posts	68
To open footways to lay waste water pipes	381
To open footways to repair waste water pipes	73
*To lay drain pipes	371
To clear and repair drain pipes	272
To reset and straighten curb	107
To renew curb	23
To cut curb	31
To repair and repave footways	78

*This includes drains for closets and plumbing fixtures, surface water, manholes, and street railway tracks; in fact, all drains which connect with city sewers or private drains.

To construct and repair driveways across footways	74
To plant trees along footways	130
To grade streets	2
To curb streets	10
To pave streets	1
To repair streets	37
To construct and change railway tracks	7
To temporarily obstruct footways and streets	91
To construct, change and repair subway conduits and manholes	26
To lay, change and repair cable wires	10
To construct manholes over drain pipes	2
To do blasting	1
To place gasoline tanks under footways	7
To repair and change gasoline tanks	3
To remove gasoline tanks	7
To lay and repair steam and other pipes	17
To place tan bark or sawdust	4
To construct and repair gutters across footways	19
To construct covers over street gutters	13
Miscellaneous	58
Total	4,547

Moneys Received by the City Engineer's Department During 1902.

There was received in the City Engineer's Department during the year 1902, the sum of $14,207.01, which was duly forwarded to the City Register.

Receipts by Months were as follows:

January	$ 485 96
February	223 12
March	286 91
April	1,039 18
May	1,152 18
June	880 22
July	1,406 94
August	1,934 67
September	1,093 27
October	1,123 78
November	2,401 57
December	2,179 21
Total receipts	$14,207 01

Financial Statement.

City Council Made the Following Appropriations Provided for in the Tax Levy of 1902.

	Appropriated.	Expended.	Balance.
*Repairs of roads, streets, etc.	$173,949 75	$175,608 22	.....
*Repairs of sewers	28,500 00	27,375 64	$1,191 97
*Maintenance bridges and culverts	25,000 00	25,674 13	.....
Paving and repairing cross streets	15,000 00	14,676 42	323 58
Livery and transportation	1,500 00	1,500 00	.....
Footway crossings	4,000 00	3,911 01	88 99
Maintenance Light-street bridge	7,900 00	6,815 30	1,084 70
Incidentals	500 00	500 00	.....
Maintenance property yard	1,500 00	1,500 00	.....
Advertising	1,000 00	922 38	77 62
Improvements in and additions to drainage system	10,000 00	9,830 63	169 37
Maintenance Block-street drawbridge	1,350 00	1,350 00	.....
Paving in front of city property	8,500 00	6,238 15	2,261 85
Salaries	28,560 00	28,560 00	.....
First and Remington avenues sewer	6,600 00	5,573 02	1,026 98
*Ogier's Run sewer	28,500 00	28,474 92	33 08
Grading and kerbing Calvert street	2,750 00	2,035 87	714 13
Grading and kerbing Twenty-ninth street	1,227 00	268 76	958 24
Widening North avenue at Peck's Run	5,460 00	3,866 83	1,593 17
Druid Hill avenue sewer	2,400 00	2,353 11	46 89
Cedar avenue lateral	2,250 00	1,987 13	262 87
Clement street sewer	3,600 00	3,600 00	.....
Garrett avenue lateral	600 00	600 00	.....
Extra grading on Maryland avenue	1,330 00	528 98	801 02
Jenkins' Run sewer	20,000 00	19,995 48	4 52

*Amount placed to credit of roads, streets, etc., for wages not called for, and also for work done for W. M. R. R. Co	1,658 47		
*Amount placed to credit of repairs of sewers received from Water Department	67 61		
*Amount placed to credit of maintenance bridges and culverts from contingent fund of P., W. and B. R. R. Co	674 13		
*Amount placed to credit of Ogier's Run from wages not called for	8 00		
	$331,976 75	$373,745 98	$10,638 98

The following amounts were carried forward from 1901 to cover contracts not completed:

Repairs of roads, streets, etc	$1,531 85
Repairs of sewers	292 50
Repairs of and painting bridges	2,221 72
Paving and repairing cross streets	2,780 24
Footway crossings	264 00
Improvements in and additions to drainage system	238 75
Paving in front of city property	432 72

The following dispositions were made of the balances December 31, 1902, which we carried forward to cover contracts not completed. The others were returned to the Sinking Fund, viz:

	Special.	Sinking Fund.
Repairs of sewers	$1,191 97	.....
Paving and repairing cross streets	323 58	.....
Footway crossings	88 99	.....
Improvements in and addition to drainage system	169 37	.....
Main Light-street bridge	.....	$1,084 70
Paving in front of city property	2,261 85	.....
First and Remington avenues sewer	.....	1,026 98
Ogier's Run sewer	33 08	.....
Grading and kerbing Calvert street	714 13	.....
Grading and kerbing Twenty-ninth street	958 24	.....
Widening North avenue at Peck's Run	1,593 17	.....
Druid Hill avenue sewer	.....	46 89
Cedar avenue lateral	.....	262 87
Extra grading on Maryland avenue	.....	801 02
Advertising	.....	77 62
Jenkins' Run sewer	.....	4 52
	$7,334 38	$3,304 60

REPORT OF TELEPHONE, TELEGRAPH, ELECTRIC LIGHT AND OTHER POLES BELONGING TO THE VARIOUS COMPANIES, AND STANDING IN THE CITY OF BALTIMORE, AS PER REPORTS RECEIVED JANUARY 1, 1903.

United Electric Light & Power Company	2,916
Chesapeake and Potomac Telephone Company	2,308
Maryland Telephone & Telegraph Company	1,489
Western Union Telegraph Company	543
Postal Telegraph Cable Company	139
Baltimore & Ohio Railroad Company	127
American Telephone & Telegraph Company	62
Baltimore & Potomac Railroad Company	40
Northern Central & Union Railroad Company	8
American District Telegraph Company	3
Total	7,635

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
468	The Maryland Pavement Company.	Repaving.	Grant street, from Baltimore to German streets.	Lump sum of $650.00.....	Aug. 1, 1903.
471	Southern Asphalt Paving Company.	Paving.	Fulton avenue, Presstman street to Penna. ave.	Sheet asphalt paving, including all necessary grading, a 6-inch concrete base, 1½-inch binder and 2-inch wearing surface, $1.54 per sq. yd.; new 6-inch kerb, including circles, set, 95c. per lin. ft.; new 5-inch kerb, including circles, set, 95c. per lin. ft.; old 6-inch kerb and circles, redressed and reset, 13c. per lin. ft.; old 5-inch kerb, including circles, redressed and reset, 14c. per lin. ft.; old 5 and 6-inch kerb, redressed in place, 13c. per lin. ft.; resetting old kerb in cross streets, 12c. per lin. ft.; 4½-inch headers for sheet asphalt paving, 65c. per lin. ft.; 3-ft. open-stone gutters, $3.40 per lin. ft.; brick gutters and brick paving for sheet asphalt. 27c. per sq. ft.; cobble paving, 6c. per sq. ft.; cobble repaving, 3½c. per sq. ft.; hauling old cobble-stone, unused, per cu. yd. per mile, 35c.; hauling old kerb, unused, per lin. ft. per mile, 7c.; hauling old flagstone, unused, per sq. ft. per mile, 4c.....	Dec. 24, 1903.

472	Southern Asphalt Paving Co.	Paving.	Mt. Royal avenue from Guilford avenue to Cathedral street, sheet asphalt; Cathedral to Dolphin streets, Granite blocks.	For sheet asphalt paving, including all necessary grading, 6 inch concrete base, 1½-inch binder and 2-inch wearing surface, $1.52 per sq. yd.; Belgian block paving, including all necessary grading, 6-inch concrete base and 2-inch of sand, 10-inch gutterstones and pouring joints with asphalt cement, $2.60 per sq. yard.; new 6-inch kerb, including circles set in place, 70c. per lin. ft.; old 6-inch kerb and circles, redressed and reset, 13c. per lin. ft.; old 6-inch kerb, redressed in place, 13c. per lin. ft.; resetting and rejoining old kerb in cross streets, 12c. per lin. ft.; 4½-inch headers, set 60c. per lin. ft.; 3-foot open stone gutters, $3.30 per lin. ft.; vitrified brick gutters and paving, 23c. per sq. ft.; cobble paving, 6c. per sq. ft.; cobble repaving, 3c. per sq. ft.; hauling old cobble-stones, unused, per cu. yd. per mile, 30c.; hauling old kerb-stones, unused, per lin. ft. per mile, 6c.; hauling old flagstones, unused, per sq. ft. per mile, 4c....	Oct. 31, 1903.

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
491	J. L. Robertson.	Repaving.	Gay street, from Jones' Falls to Exeter street.	Grading, 40c. per cu. yd.; Belgian block paving, including a bed of sand 6-inch thick, and pouring the joints with paving cement, $1.70 per sq. yd.; new flagstones set, 30c. per sq. ft.; new 10-inch gutterstones, set, 25c. per lin. ft.; new 6-inch kerb, 85c. per lin. ft.; new 6-inch kerb-circles, set, $1.70 per lin. ft.; Belgian block repaving, including all necessary grading or filling, a bed of sand 6-inches thick and pouring joints with paving cement, 79c. per sq. yd.; old 6-inch kerb and circles reset, 12c. per lin. ft.; old 6-inch kerb rejointed, 12c. per joint; old 16-inch gutterstone reset, 6c. per lin. ft.; old 10-inch gutterstones rejointed, 10c. per joint; old flagstones relaid, 10c. per sq. ft.; old flagstones rejointed, 10c. per lin. ft. of edge; cobble repaving in cross streets, 4½c. per sq. ft.; resetting kerb in cross streets, 10c. per lin ft.....	Aug. 31, 1904.

530	John Trainor.	Repaving.	Over drains.	Bills for repaving guaranteed	June 6, 1903
534	John L. Robertson.	Grading, paving, etc.	Eager street, from Chester street to Collington ave.	For grading, 19c. per cu. yd.; for Belgian block paving, including gutterstones, and a bed of sand, 12 inches thick, $1.69 per sq. yd.; new flagstones set, 34c. per sq. ft...	June 6, 1905.
559½	Samuel Fosner and W. W. Frederick.	Tunnel.	Clay street.	Special bond of $500 to cover Board of Estimates charges.	
560½	Maryland Biscuit Co.	Drainpipe.	Charles street.	Special bond of $500 to cover Board of Estimates charges.	
595	Chas. A. Hook.	Paving.	Clifton avenue from Ninth street to Eighth street.	Macadam, (gabbro-stone), including grading, 84c. per sq. yd.; vitrified brick gutters, complete, 23c. per sq. ft.; new flagstones, set, 45c. per sq. ft.; extra grading, approaches, 25c. per cub. yd.	Apr. 16, 1903.
596	Chas. A. Hook.	Paving.	Thirteenth street from North avenue to Clifton avenue.	Macadam, (gabbro-stone), including grading, 77c. per sq. yd.; vitrified brick gutters, complete, 23c. per sq. ft.; new flagstones, set, 45c. per sq. ft., extra grading, approaches, 25c. per cub. yd.....	Apr. 16, 1903.
608	Wallace King.	Tunnel and Bridge.	Goodwin alley.	Special bond of $1,000. Work guaranteed	July 12, 1903.
613	Baltimore & Ohio Railroad Co.	Repaving.	Over drain in Calvert street.	Work guaranteed.	Aug. 28, 1903.

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
615	Maryland Pavement Company.	Paving.	Eutaw place from North avenue to Whitelock st.	Asphalt block paving, including grading, 4-inch concrete base, ½-in mortar bed and asphalt blocks, 3x4x12 inch, $2.35 per sq. yd.; old kerb reset, including redressing, where necessary, 20c. per lin. ft.; cobble repaving in cross streets, 27c. per sq. yd.; 4½-inch headers, 60c. per lin. ft.; old flagstones reset, 12½c per sq. ft.....	Five years after acceptance of work.
616	Maryland Pavement Company.	Paving.	Bank lane, from Charles to St. Paul streets.	Asphalt block paving, including foundation and pavement complete, $2.00 per sq. yd.; new 6-inch kerb, including circles set in place, straight kerb, $1.00 per lin. ft. and circles $2.00 per lin. ft.; old 6-inch kerb and circles redressed and reset, 20c. per lin. ft.; old 6-inch kerb and circles redressed in place 10c. per lin. ft.; new 10-inch gutters, 50c. per lin. ft.; Belgian block repaving, 3c. per sq. ft.; resetting flagstones, 12½c. per sq. ft.....	Sept. 25, 1906.

617	Maryland Pavement Company.	Paving.	Bank lane, from Calvert to St. Paul street.	Asphalt block paving, including foundation and pavement complete, $2.00 per sq. yd.; new 6-inch kerb, including circles, set in place, straight kerb, $1,00 per lin. ft., and circles $2.00 per lin. ft.; old 6-inch kerb and circles, redressed and reset, 20c. per lin. ft.; old 6-inch kerb and circles redressed in place, 10c. per lin. ft.; new 10-inch gutters, 50c. per lin. ft.; Belgian block repaving, 3c. per sq. ft.; resetting flagstones, 12½c. per sq. ft.....	Sept. 11, 1906.
665	Edw. J. Gallagher.	Setting kerb.	S. S. Fairmount ave., bet. Chesapeake and Grove streets.	Private contract; work guaranteed ..	Apr. 18, 1903.
666	The Southern Asphalt Paving Company.	Paving.	Baltimore street, from Grove street to Eastern City Limits.	Sheet asphalt paving, inc. 6 inch concrete base, 1½ inches of binder and 2 inches of wearing surface, $2.17 per sq. yd. Cobble repaving in cross streets, 36c. per sq. yd. New 6 inch kerb and circles, set in place, $1.00 per lin. ft. 4½ inch headers set, 60c. per lin. ft. Will purchase old cobble and gutterstone, ¼c. per sq. ft. Will purchase old kerbstone, 3c. per lin. ft. Extra grading, not inc. in paving, 39c. per cu. yd. Vitrified brick gutters, $2.30 per sq. yd	For five years from acceptance. See report on this street. Not completed

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
667	F. W. Melville.	Setting kerb.	S. S. Stockholm st., bet. Ward st. and Columbia av.	Private contract; work guaranteed.	May 27, 1903.
668	The Southern Asphalt Paving Company.	Repairing and resurfacing sheet asphalt streets and bridge roadways	.....	Area less than 100 sq. yds., and guaranteed for one year; concrete base, 6 inches thick, 50c. sq. yd.; binder, 1½ inches thick, 65c. sq. yd.; wearing surface, 1½ inches thick, $1.50 sq. yd.; wearing surface, 2 inches thick, $1.60 sq. yd.; area 100 sq. yds. or more, and guaranteed the 5 years; concrete base, 6 inches thick, 50c. sq. yd.; binder, 1½ inches thick, 65c. sq. yd.; wearing surface, 1½ inches thick, $1.60 sq. yd.; wearing surface, 2 inches thick, $1.70 sq. yd.	(See plats for dates of guaranties expiration in 1903.)
669	Filbert Paving and Construction Co.	Paving.	St. Paul street, from 25th to 30th streets.	Sheet asphalt paving, inc. grading, 6 inch concrete base, 1½ inches of binder and 2 inches of wearing surface, $2.18 sq. yd; vitrified brick paving, inc. grading, 6-inch concrete base and sand cushion, (wire-cut brick,) $2.19 sq. yd.; new 6-	

				inch kerb and circles, set in place, $1.13 lin. ft.; old kerb and circles, redressed and reset, 17c. lin. ft.; old kerb and circles, redressed in place, 17c. lin. ft.; old kerb in cross streets, reset and rejointed, 15c. lin. ft.; 4½ inch headers, set, 60c. lin. ft.; new cobble paving in cross streets, 7c. sq. ft.; cobble repaving in cross streets, 5c. sq. ft.; will purchase old cobble and gutterstone for 8c. sq. yd.; will purchase old kerbstone for 10c. lin. ft.; will purchase old flagstone for 5c. sq. ft.	Dec. 30, 1906.
670	Schneider & Company.	Paving.	Payson street, from Baltimore to Hollins st.	Private contract; work guaranteed.	June 21, 1903.
674	Schneider & Co.	Paving.	Chesapeake street, from Fairmount avenue to Fayette street.	Vitrified brick paving, inc. grading (fill) 8-inch sand and gravel base, $1.45 sq. yd. New 5-inch kerb and circles, set in place, 70c. lin. ft. Extra grading, not inc. in paving, 18c. sq. yd.	Aug. 23, 1907.
676	John L. Robertson.	Paving footways.	St. Paul street bridge.	10¼c. per sq. ft. cement pavement, inc. removal old material and cleaning up.	Sept. 26, 1906.
678	Central Real Estate and Trust Co., and Jno. S. Moke.	Paving.	St. Paul st., from 30th to 31st sts.	Private contract; work guaranteed.	Nov. 12, 1906.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
680	The Maryland Pavement Company.	Paving.	Bayard street from Columbia avenue to Herkimer st.	Asphalt blocks, laying and grouting same, 4-inch concrete and ½-inch mortar bed, $2.30; grading, 20c.; total, $2.50 sq. yd. Belgian block repaving in cross streets, 30c. sq. yd. New 5-inch kerb and circles, set in place, 75c. lin. ft. Old kerb and circles redressed and reset, 20c. lin. ft. Old kerb and circles redressed in place, 10c. lin. ft. Four and one-half inch headers, set, 65c. lin. ft. Old flagstone, reset, 15c. sq. ft. Extra grading, not included in paving, 25c. cu. yd.	July 26, 1907.
681	The United Railways and Electric Company.	Paving.	Twenty-fifth street from Maryland ave. to Charles st.	Private contract; work guaranteed..	Oct. 26, 1906.
682	Daniel Sullivan.	Paving.	Collins ave., 617 feet south from Frederick ave. and Augusta ave. from Frederick ave. to Walrad st.	Macadam pavement, 6 inches thick, including 550 cu. yds. grading, 74c. sq. yd.; if rotten rock used instead of gabbro screenings, 64c. sq. yd. Vitrified brick gutters, with cobble rebuts, 87c. sq. yd. Flagstone crossings, 33c. sq. ft.; extra grading, not included in paving, 30c. sq. yd....	Aug. 18, 1904.

683	Filbert Paving and Construction Co.	Paving	Maryland avenue, from 25th to 29th streets.	Belgian block paving, including 2,750 cu. yds. of grading, and 10-inch gutterstone, $1.90 sq. yard. Belgian block repaving in cross streets, 97c. sq. yd. New 4½-inch kerb and circles, 72c. lin. ft. Old kerb and circles redressed and reset, 22c. lin. ft. Old kerb and circles redressed in place, 10c. lin. ft. New flagstones, set, 37c. sq. ft. Will purchase old cobble and gutterstone, ¼ of 1c. sq. ft. Will purchase old kerbstone, 4c. lin. ft. Extra grading, not included in paving, 20c. cu. yd.....	June 12, 1907.
686	Maryland and Pennsylvania R. R. Co.	Bridge.	Remington ave.	Maintenance by R. R. Co.....	Perpetual.
687	F. D. Pullen & Co.	Post on footway.	West side Eutaw st., 12 feet north of Wayne st.	Special bond of indemnity.	25 years from Oct. 28, 1901, or on removal of post
691	W. G. H. and J. E. Myers and H. C. Howard.	Setting kerb.	Grant st., side of 117 E. Balto. st.	Private contract; work guaranteed..	Nov. 22, 1903.
692	John T. Smith and Fredk. W. Loeber..	Sand.	General purposes.	Screened sand in Districts Nos. 1, 2 and 5, 75c. cu. yd.; paving sand in Districts Nos. 1 and 2, 55c. cu. yd.; paving sand in District No. 5, 53c. cu. yd.....	Dec. 31, 1902.
693	Anna Diller.	Sand.	General purposes.	Paving sand in Districts Nos. 3 and 4, 60c. cu. yd.....	Dec. 31, 1902.

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
694	Shreve & Co.	Sand.	General purposes.	Screened sand in District No. 4, 71c. cu. yd	Dec. 31, 1902.
695	M. F. Leonard.	Sand	General purposes.	Screened sand in District No. 3, 75c. cu. yd	Dec. 31, 1902.
696	Maryland Pavement Co.	Asphalt blocks.	General purposes.	Size 3x4x12 inches, 5¼c. each; size 4x4x12 inches, 6c. each; size 4x5x12 inches, 6½c. each; size 3x5x12 inches, 6c. each	Dec. 31, 1902.
697	Filbert Paving and Construction Co.	Repairing and resurfacing sheet asphalt streets and bridge roadways.		Area less than 100 sq. yds., guarantee 1 year; concrete base, 6 inches thick, 50c. sq. yd.; binder, 1½ inches thick, 63c. sq. yd.; wearing surface, 1½ inches thick, $1.55 sq. yd.; wearing surface, 2 inches thick, $1.63 sq. yd. Area more than 100 sq. yds., guarantee 5 years, concrete base, 6 inches thick, 50c. sq. yd.; binder, 1½ inches thick, 63c. sq. yd.; wearing surface, 1½ inches thick, $1.63 sq. yd.; wearing surface, 2 inches thick, $1.71 sq. yd.	

No.	Contractor.	To Furnish.	For.	Prices.				Expires, (Including Guaranties.)
698	Wm. Wirt Clarke & Son.	Vitrified sewer pipe.	General purposes.	Single strength:				
				Size.	Price.	Yard. (Dist.)	Gen. Del. (Dist.)	R.R (Dist.)	
				12 in.	$1.00 per ft.	73¾%	73¾%	75%	
				15 in.	1.35 "	73¾%	73¾%	75%	
				18 in.	1.70 "	73½%	73½%	75%	
				20 in.	2.25 "	73½%	73½%	75%	
				24 in.	3.25 "	73½%	73½%	75%	
				Double strength:					
				12 in.	$1.00 per ft.	73¾%	73¾%	75%	
				15 in.	1.35 "	68¾%	68¾%	70%	
				18 in.	1.70 "	64½%	64½%	66%	
				20 in.	2.25 "	64½%	64½%	66%	
				24 in.	3.25 "	64½%	64½%	66%	
				30 in.	5.50 "	55½%	55½%	58%	Dec. 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
699	Wm. Wirt Clarke & Son.	Vitrified paving blocks.	General purposes.	Iron Rock, Canton and Metropolitan blocks, f. o. b. Baltimore, $24.00 per thousand, delivered at City Yard, $25.75 per thousand.....	Dec. 31, 1902.
700	Wm. D. Gill & Son.	Lumber.	General purposes	Georgia pine, Savannah Mcht. quality, all sizes, $22.45 per thousand ft.; white pine, No. 1 barn, 1x12x16 inches, $26.50 per thousand ft.: white pine, No. 1 barn, 2x12x16 inches, $27.45 per thousand ft.; Virginia pine, Mcht. quality, all sizes, $13.95 per thousand ft.; Virginia pine stock culls, 1x12 inches, 12 to 16 ft., $16.45 per thousand ft.; North Carolina pine, Mcht. quality, all sizes, $13.95 per thousand ft.; North Carolina pine, stock culls, 1x12 inches, 12 to 16 ft., $16.45 per thousand ft.; white oak, firsts and seconds, all sizes, $45.00 per thousand ft.; white oak, selects, $45.00 per thousand ft.....	Dec. 31, 1902.
701	National Building Supply. Co.	Vitrified sewer brick.	General purposes.	"Red Shale" brick, f. o. b. Baltimore, $14.30 per thousand; delivered at Belair lot, $16,00 per thousand....	Dec. 31, 1902.

702	Michael Adams, Jr.	Sewer brick.	General purposes.	Machine made "Martin" sewer brick, $6.50 per thousand	Dec. 31. 1902.
703	National Building Supply Co.	Cement.	General purposes.	Domestic Portland "Paragon" cement, $1.53 per bbl. and 42c. per bag; rebate, 10c. per bbl. and bag returned	Dec. 31, 1902.
704	Maryland Cement Co.	Cement.	General purposes.	Domestic Slag Portland "Toltec" cement, $1.50 per bbl. and 40c. per bag; rebate, 10c. per bbl. and bag returned	Dec. 31, 1902.
705	B. Wallis & Co.	Cement.	General purposes.	Natural "Cumberland" Hydraulic cement, $1.09 per bbl. and 51c. per bag; rebate, 10c. per bbl. and bag returned. Foreign "Globe" Portland cement, $2.15 per bbl.; rebate, 10c. per bbl., returned	Dec. 31, 1902.
706	I. H. Peddicord & Sons' Quarry and Transfer Co.	Sewer building stone.	General purposes.	Measured in place, District No. 2, $2.25 per cu. yd	Dec. 31, 1902.
707	Jas. H. Atkinson.	Sewer building stone.	General purposes.	Measured in place, District No. 3, $2.25 per cu. yd	Dec. 31, 1902.
708	The Schwind Quarry Co.	Sewer building stone.	General purposes.	Measured in place, Districts Nos. 4 and 5, $2.50 cu. yd	Dec. 31, 1902.
709	D. A. Leonard.	Sewer building stone.	General purposes.	Measured in plaee, District No. 1, $2.20 cu. yd	Dec. 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
710	D. A. Leonard.	Broken stone, gneiss screenings and mosaic paving stone.	General purposes.	Broken stone, gneiss Nos. 1 and 2, District No. 3, $1.65 per cu. yd.; broken stone, gneiss No. 3, District No. 3, $1.65 per cu. yd ; gneiss screenings, District No. 3, 93c. per cu. yd.; mosaic paving stone, 63½c. sq. yd; in Districts Nos. 1, 2, 3, 4 and 5....	Dec. 31, 1902.
711	Jas. H. Atkinson.	Broken stone and stone dust.	General purposes.	Broken stone, gneiss Nos. 1 and 2, District No. 4, $1.85 per cu. yd.; broked stone, gneiss No. 3, District No. 4, $2.00 per cu. yd.; stone dust, District No. 4, $1.25 per cu. yd....	Dec. 31, 1902.
712	I. H. Peddicord & Sons' Quarry and Transfer Co.	Broken stone and gneiss screenings.	General purposes.	Broken stone, gneiss Nos. 1 and 2, District No. 2, $1.50 per cu. yd.; broken stone, gneiss No. 3, District No. 2, $1.74 per cu. yd.; gneiss screenings, District No. 2, 85c. cu. yd., and District No. 4, $1.35 cu. yd.....	Dec. 31, 1902.
713	The Schwind Quarry Co.	Broken stone, gneiss screenings and stone dust.	General purposes.	Broken stone, gneiss Nos. 1 and 2, District No. 1, $1.55 per cu. yd., and District No. 2, $1.50 per cu. yd.; broken stone, gneiss No. 3, District No. 1, $1.75 per cu. yd.; gneiss screenings, District No. 1, $1.10 per cu. yd.; stone dust, District No. 1, 80c. per cu. yd., District No 2, 90c. per cu. yd., and District No. 3, $1.00 per cu. yd.....	Dec. 31, 1902.

714	Burns & Russell Co.	Paving and sewer brick.	General purposes.	No. 1 paving brick, $10.50 per thousand; No. 2 paving or Arch paving brick, $8.50 per thousand; hand-made sewer brick, $7.25 per thousand	Dec. 31, 1902.
715	Chas. A. Hook, Jr.	Broken stone and gabbro screenings.	General purposes.	Gabbro or nigger head Nos. 1, 2 and 3, and gabbro or nigger head screenings, in Districts No. 1, 2, 3 and 4 $2 50 per cu. yd	Dec. 31, 1902.
716	Jas. H. Atkinson.	Gutterstone.	General purposes.	10-inch Standard Gutterstone, 25c. per lin. ft.	Dec. 31, 1902.
717	Jas. H. Atkinson.	Cobble or rubblestone.	General purposes.	In district No. 3, $1.80 per perch	Dec. 31, 1902.
718	D. A. Leonard.	Cobble or rubblestone.	General purposes.	In district No. 5, $1.89 per perch	Dec. 31, 1902.
719	I. H. Peddicord & Sons' Quarry and Transfer Co.	Kerbstones and circles.	General purposes.	4½-inch curbstones, 55c. per lin. ft.; 4½-inch kerb circles, $1.10 per lin. ft.; 5-inch kerbstones, 60c. per lin. ft.; 5-inch kerb circles, $1.20 lin. ft.	Dec. 31, 1902.
720	I. H. Peddicord & Sons' Quarry and Transfer Co.	Cobble or rubblestone.	General purposes.	In district No. 2, $1.85 per perch	Dec. 31, 1902.
721	The Schwind Quarry Co.	Cobble or rubblestone.	General purposes.	In district No. 1, $1.85 per perch; in district No. 4, $1.95 per perch	Dec. 31, 1902.
722	The Schwind Quarry Co.	Flag and gutterstones.	General purposes.	Flagstones, inc. 3 rows blocks, 25c. sq. ft.; gutterstones, 10-inch hammer-dressed, 20c. lin. ft.	Dec. 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
723	Maryland Telep. and Teleg. Co.	Blasting.	Liberty rd., Slingluff ave. and Walbrook vicinity.	Under special provisions.....	Feb. 21, 1903.
724	H. Wehr & Co.	Hardware.	General purposes.	9-lb. picks (⅓ lot), $4.75 per doz.; pick handles, 90c. per doz.; galv. iron water buckets, (⅓ lot), $2.00 per doz.; crow-bars, 15 to 18 lbs., 3¼c. per lb.; bar iron, square, (⅓ lot), $1.80 per lb. base; bar iron, round, (⅓ lot), $1.80 per lb., base.....	Dec. 31, 1902.
725	Wilcox Hardware & Iron Co.	Hardware.	General purposes.	9-lb. picks (⅓ lot), $4.75 per doz.; galv. iron water buckets (⅓ lot), $2.00 per doz.; steel wheelbarrows, $4.50 each; bar iron, square, (⅓ lot), $1.80 per lb. base; bar iron, round, (⅓ lot), $1.80 per lb. base; bar cast steel (½ lot), 7c. per lb. base; Ames' shovels, $10.00 per doz.....	Dec. 31, 1902.
726	Filbert Paving and Construction Co.	Paving.	Hanover st., from Fort avenue to Winder st.	Belgian block paving, includ'g 9-inch base and 10-inch gutterstone, $2.08 per sq. yd.; cobblestone repaving in cross streets, 30c. per sq. yd.; new 5-inch kerb and circles, set, 99c. per lin. ft.; old kerb and circles redressed and reset, 18c. per lin. ft.; old kerb and circles redressed in place, 22c. per lin. ft.; new flagstones set, 34c. per sq. ft. Will purchase old cob-	

				ble and gutterstone at ¼c. per sq. ft., old kerbstone at 5c. per lin. ft., and old flagstones at 2c. per sq. ft. Old flagstones redressed and reset, 7c. per sq. ft.	Sept. 29, 1907.
727	John Brown & Sons	Tape lines.	General purposes.	Twenty-five ft. metallic tape lines, $1.25 each.	Dec. 31, 1902.
728	The Maryland Pavement Co.	Paving.	Ashland ave. from Patterson Park ave. to Chester st.	Asphalt blocks, inc. grading, 4-inch concrete and ½-in. mortar base, $2.35 per sq. yd.; cobble paving in cross streets, 27c. per sq. yd.; cobble repaving in cross streets, 27c. per sq. yd.; new 5-in. kerb and circles, set, $1.00 per lin. ft.; old kerb and circles redressed and reset, 25c. per lin. ft.; old kerb and circles redressed in place, 15c. per lin. ft.; 4½-inch headers set, 75c. per lin. ft.; extra grading, not included in paving, 25c. per cu. yd	5 years after acceptance.
729	John L. Robertson.	Paving.	Warren ave., for 1,380 feet east of Light st.	Asphalt block paving, inc. grading, 4-inch concrete base, $2.27 per sq. yd.; cobble repaving in cross streets, 36c. per sq. yd.; new 5-inch kerb and circles, set, $1.00 per lin. ft.; old kerb and circles redressed and reset, 4½-inch, 28c. per lin. ft.; old kerb and circles redressed in place, 18c. per lin. ft.; 4½-inch headers, set, 75c. per lin. ft. Will purchase old gutter and cobblestone at 1c. per sq. ft.	5 years after acceptance.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
730	John L. Robertson.	Paving.	North ave., from Br'dw'y to Greenmount ave.	Asphalt block paving, inc. grading, 6-inch concrete base, $2.42 per sq. yd.; cobble paving in cross streets, 63c. per sq. yd.; cobble repaving in cross streets, 36c. per sq. yd.; new 5-inch kerb and circles, set, $1.00 per lin. ft.; old kerb and circles redressed and reset, 28c. per lin. ft.; old kerb and circles redressed in place, 18c. per lin. ft.; new 4½-inch headers, set, 75c. per lin. ft.; old curb reset for headers, 15c. per lin. ft. Will purchase old curbstone at 15c. per lin. ft., old flagstone at 10c. per sq. ft., and old cobble and gutterstone at 1c. per. sq. foot.....	Five years after acceptance.
731	John L. Robertson.	Paving.	McCulloh street, from Lanvale street to Lafayette avenue.	Asphalt block paving, inc. grading, 4-inch concrete base, $2.25 per sq. yd.; cobble repaving in cross streets, 36c. per sq. yd.; new 5-inch curb and circles set, $1.00 per lin. foot.; old curb and circles redressed and reset, 28c. per lin. ft.; old curb and circles redressed in place, 18c. per lin. ft. Will purchase old cobble and gutterstone at 1c. per sq. ft., old curbstone at 15c. per lin. ft., and old flagstone at 10c. per sq. ft.....	Five years after acceptance.

732	John L. Robertson.	Paving.	North avenue, for 150 feet west of Penna. avenue.	Asphalt block paving, inc. grading, 6-inch concrete, $2.39 per sq. yd.; cobble repaving in cross streets, 36c. per sq. yd.; new 5-inch curb and circles set, $1.00 per lin. ft.; old curb and circles redressed and reset, 28c. per lin. ft.; old curb and circles redressed in place, 18c. per lin. ft.; 4½-inch headers, furnished and set, 75c. per lin. ft.; 10-inch standard gutterstone, 50c. per lin. ft. Will purchase old cobble and gutterstone for 1c. per sq. ft., old curbstone for 15c. per lin. ft., and old flagstone for 10c. per sq. ft.....	Five years after acceptance.
733	John L. Robertson.	Paving.	Fulton avenue, from Pennsylvania avenue to Druid Hill avenue.	Asphalt block paving, inc. grading, 6-inch concrete, $2.39 per sq. yd.; cobble repaving in cross streets, 36c. per sq. yd.; Belgian block repaving in cross streets, 50c. per sq. yd.; new 5-inch curb and circles set, $1.00 per lin. ft.; old curb and circles redressed and reset, 28c. per lin. ft ; old curb reset for headers, 15c. per lin. ft. Will purchase old cobble and gutterstone for 1c. per sq. ft., old curbstone for 15c. per lin. ft., and old flagstone for 10c. per sq. ft.	Five years after acceptance.
734	Patrick Keelty.	Grading.	Calvert st., from 25th street to Gilmor lane, and 29th st., from St. Paul st. to Maryland ave.	Excavation, 29c. per cu. yd.; borrow, 14c. per cu. yd.....	

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
735	Patrick Keelty.	Grading.	North ave., from Slingluff ave. to Fifth st.	34c. per cubic yard.	
736	Henry Smith & Sons.	Temporary tracks.	Gay st., from Pratt st. to Water st.	Special indemnity bond of $50,000. .	Upon removal of tracks.
737	Chas. A. Briscoe.	Setting kerb.	1001 to 1029 Claret street.	Under private contract; work guaranteed..	May 17, 1904.
738	Patrick Keelty.	Paving.	Fayette st. and Phila. road, from Luzerne to Patapsco sts.	Grading, 20c. per cu. yd.; cobble or rubblestone pavements, inc. gutterstones, 80c. per sq. yd.; 4½-inch kerbstones, 65c. per lin. ft.; 4½-inch circles, $1.30 per lin. ft.; flagstone crossings, inc. blocks, 35c. per sq. ft.; repaving cobble or rubblestone pavement, inc. gutterstones and furnishing all materials required to repave the area of pavement, removed, 35c. per sq. yd.; resetting kerbstones and circles, 10c. per lin. ft.; relaying flagstone crossings, 4c. per sq. ft.	Five years after acceptance.
739	The Southern Asphalt Paving Company.	Paving.	St. Paul st., from North ave. to 25th street.	Sheet asphalt paving, inc. grading, 6-inch sand and 6-inch cobblestone base, 1½-inch binder, and 2-inch	

				wearing surface, $2.08 per sq. yd.; vitrified brick paving, inc. grading, 6-inch sand and 6-inch cobblestone, $2 09 per sq. yd.; Belgian block paving, $2.60 per sq. yd.; Belgian block repaving, 70c. per sq. yd.; vitrified brick gutters in cross streets, $2.60 per sq. yd.; cobblestone repaving in cross streets, 40c. per sq. yd.; new 5-inch kerb and circles set in place, 90c. per lin. ft.; old kerb reset, 20c. per lin. ft.; old kerb and circles redressed and reset, 30c. per lin. ft.; old kerb and circles redressed in place, 15c. per lin. ft.; 4½-inch headers furnished and set, 60c. per lin. ft.; old kerb reset for headers, 30c. per lin. ft....	Nov. 19, 1907.
740	The Southern Asphalt Paving Co.	Paving.	Baltimore st., from Chesapeake to Grove sts.	Sheet asphalt paving, inc 6-inch concrete base, 1½-in. binder, 2-in. wearing surface, $2.25 per sq. yd.; new 6-inch kerb and circles set, $1.10 per lin. ft.; old kerb and circles redressed and reset, 35c. per lin. ft.; 4½-inch headers set, 65c. per lin. ft.; vitrified brick gutters, $2 60 per sq. yd	Sept. 11, 1907.
741	E. Scott Payne & Bro.	Hardware.	General purposes.	60d wire nails, $2.20 per keg; 50d wire nails, $2.20 per keg; 40d wire nails, $2.20 per keg; 10d wire nails, $2.25 per keg; 6d wire nails, $2.40 per keg; 20d cut nails, $2.15 per keg; 10d cut nails, $2.20 per keg; galvanized iron water buckets (⅛ lot), $2.00 per doz.; bar iron, square (⅛ lot), $1.80 per lb. base; bar iron, round (⅛ lot), $1.80 per lb. base; bar tool steel, 7c. per lb. base; bar cast steel (⅛ lot), 7c. per lb. base...	Dec. 31, 1902.

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
742	Healy & Bro.	Repaving.	Over drains.	Bills for repaving guaranteed.....	Feb. 13, 1903.
743	Carolina Palm.	Setting curb.	3115-3117 W. North ave.	Under private contract; work guaranteed.....	June 12, 1904.
744	W. H. Rothrock & Co.	Repaving.	Over drains.	Bills for repaving guaranteed.....	June 25, 1903.
745	Jos. J. Miller.	Setting curb.	W. North ave.	Under private contract; work guaranteed.....	June 30, 1904.
746	Geo. W. Walther & Co.	Repaving.	Over drains.	Bills for repaving guaranteed.....	July 2, 1903.
747	U. S. Wood Preserving Co.	Paving.	Calvert st., from German to Baltimore sts.	Wooden block paving, 6-inch concrete base, $3.50 per sq. yd.; Belgian block repaving in cross streets, 25c. per sq. yd.; old curb and circles redressed and reset, 50c. per lin. ft.; old curb and circles redressed in place, 30c. per lin. ft.; reset Belgian blocks on 6-inch concrete for headers, $1.50 per sq. yd.; will purchase Belgian blocks and gutterstone at 2c. per sq. ft., and old flagstone at 1½c. per sq. ft.....	5 years after acceptance.

749	Edw. Brady & Son.	Repaving.	Hargrove alley, south of Madison street.	Under private contract; work guaranteed.....	July 23, 1904.
750	Dan'l Sullivan.	Setting curb and gutter.	Barclay st. and Waverly ave.	Under private contract; work guaranteed.....	July 30, 1904.
751	Dan'l Sullivan.	Paving.	Brunt st., from Bloom to Baker street.	Cobblestone, inc. gutters, $1.09 per sq. yd.; cobblestone paving in cross streets, $1.00 per sq. yd.; cobblestone repaving, 49c. per sq. yd.; new 5-inch kerb and circles, set, 90c. per lin. ft.; new 4½-inch kerb and circles, set, 80c. per lin. ft. for straight and $1.50 per lin. ft. for circular; old kerb and circles redressed and reset, 15c. per lin. ft.; old kerb and circles, reset, 15c. per lin. ft.; new flagstones, set, 30c. per sq. ft. Extra grading not included in paving, 30c. per cu. yd.....	5 years after acceptance.
752	Wm. M. Elder.	Paving.	Montford avenue, from Townsend st. to Gay st.	Cobble paving, inc. grading, 94c. per sq. yd.; cobble repaving in cross streets, 36c. per sq. yd.; new 4½-inch kerb and circles, set, 65c. per lin ft. for straight and $1.30 per lin. ft. for circular; old kerb and circles redressed and reset, 29c. per lin. ft.; new flagstones, set, 32c. per sq. ft. Extra grading, not inc. in paving, 30c. per cu. yd. Will purchase old cobble and gutterstone for 1c. per sq. ft., and old curbstone for 10c. per lin. ft.....	5 years after acceptance.

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties)
753	Henry Seim & Co.	Repaving.	Over-drains.	Bills for repaving guaranteed.....	Sept. 6, 1903.
754	Ferguson & McCullough.	Paving.	Rose st. from Fairmount avenue to Fayette st.	New cobble paving, inc. grading and guttering, $1.02 per sq. yd.; cobble repaving, 27c. per sq. yd.; new 4½-inch kerb, set, 69c. per lin. ft.; 4½-inch kerb, reset and redressed, 35c. per lin. ft.; 4½-inch kerb, reset, 10c. per lin. ft.; new flagstones, set, 33c. per sq. ft.; flagstones, reset, 5c. per sq. ft.....	5 years after acceptance.
755	Wm. M. Elder.	Paving.	Carey street, from Columbia avenue to Ward st.	New cobble paving, inc. grading, 88c. per sq. yd.; cobble repaving, 36c. per sq. yd.; 4½-inch new kerb (gneiss) set, 65c. per lin. ft.; circles, $1.30 per lin. ft.; 4½-inch kerb, reset and redressed, 30c. per lin. ft.; 4½-inch kerb, redressed in place, 25c. per lin. ft.; Belgian block repaving, 12c. per sq. yd.; vitrified brick repaving, 12c. per sq. ft.; new flagstones, set, 32c. per sq. ft.; flagstones, reset, 4c. per sq. ft.....	5 years after acceptance.
756	Leopold Pfefferkorn.	Post on footway.	412 S. Eutaw st.	Special bond of indemnity.....	25 years from Sept. 18, '02, or on removal of post.

757	Filbert Paving and Construction Co.	Paving.	Henry street, from Warren avenue to Hamburg street.	Belgian block paving, inc. grading, $2.30 per sq. yd.; cobble repaving in cross streets, 35c. per sq. yd.; new 4½-inch curb set, 75c. per lin. ft.; old curb and circles redressed and reset, 30c. per lin. ft.; old curb and circles redressed in place, 20c. per lin. ft.; new flagstones set, 35c. per sq. ft.; flagstones reset, 9c. per sq. ft	Five years after acceptance.
758	E. Glenn Perine.	Setting curb and footway.	Stable alley.	Under private contract; work guaranteed	Nov. 5, 1904.
759	The Peabody Heights Company.	Grading.	28th st., between Maryland avenue and Charles st.	Under private contract	On completion of work.
760	Lloyd L. Jackson Company.	Setting curb and footway.	Gillingham alley.	Under private contract; work guaranteed	Nov. 18, 1904.
761	Edw. J. Gallagher.	Setting curb.	S. S. Fayette st., betw. Baxter st. and Kenwood av.	Under private contract; work guaranteed	Nov. 6, 1904.
762	The Consolidated Gas Company.	Repaving.	General work.	Work to be done by City Engineer and bills rendered monthly	Dec. 1, 1903.
763	E. P. Callow.	Setting curb and gutter.	160 ft. on N. S. Whitelock street, betw. Linden av. and Bolton ave.	Under private contract; work guaranteed	Dec. 4. 1904.

CONTRACTS IN FORCE IN THE CITY ENGINEER'S DEPARTMENT DECEMBER 31, 1902.

No.	Contractor.	To Furnish.	For.	Prices.	Expires, (Including Guaranties.)
764	Daniel Sullivan.	Paving.	Northwest street, from Fulton ave. to Payson st.	Vitrified brick paving, inc. grading, $1.97 per sq. yd.; cobblestone paving in cross streets, 80c. per sq. yd.; vitrified brick repaving in cross streets, 50c. per sq. yd; new 4½-inch curb and circles set, 65c. per lin. ft.; old curb and circles redressed and reset, 18c. per lin. ft.; old curb and circles redressed in place, 10c. per lin ft.; 4½-inch headers set, 45c. per lin ft.; extra grading not inc. in paving, 33c. per cu. yd.; cobblestone repaving in cross streets, 40c. per sq. ft. Will purchase old cobble and gutterstone for 2c. per sq. ft., and old curbstone for 10c. per lin. ft.....	Five years after acceptance.
765	Jas. Connolly's Sons.	Repaving.	Overdrains.	Bills for repaving guaranteed.....	Aug. 21, 1903.

REPORT OF

O. W. CONNET, Assistant City Engineer.

1902.

City Engineer's Office,
Baltimore, January 1, 1902.

Mr. B. T. Fendall,
City Engineer.

Dear Sir:—I respectfully submit the following report of the work done under my direction during the year ending December 31, 1902.

This includes new improved pavements paid out of the levy for 1902; paving done by assessment; supervision of guaranteed pavements; reconstruction, painting and repairs of bridges; supervision of Light street and Block street draw-bridges; footway pavements and grade establishments.

Following is a detailed report of the cost and description of the work done:

IMPROVED PAVEMENTS.

The total area of improved pavements laid during the year 1902 is 60,564 square yards. This area does not include any improved pavements taken up and relaid with new material of the same kind, nor is this class of pavement included in the detailed statement of the different kinds of paving following.

NEW VITRIFIED BRICK.

St. Paul st., North ave. to Twenty-fifth st., Mack blocks ...	666 sq. yds.
Baltimore st., Kenwood ave. to east city limits, (incomplete), Mack blocks	397 sq. yds.
Chesapeake st., Fairmount ave. to Fayette st., Maxwell blocks.....	2,024 sq. yds.
Total.....	3,087 sq. yds.

Besides the above, which were laid by the city on public streets, the following were laid on private streets by private contract:

Jackson st., Randall to Heath st	1,095	sq. yds.
Madeira, Oliver to Federal st., Maxwell blocks	957	sq. yds.
Clifton street, Fulton to Friendsbury (incomplete)	712	sq. yds.
Lansdown st., Monroe to Payson, (incomplete), Montello blocks	608	sq. yds.
Total	3,372	sq. yds.

NEW ASPHALT BLOCK.

The increase in asphalt blocks laid during the year is as follows:

Bayard st., Columbia ave. to Herkimer st	3,282	sq. yds.
North ave., Greenmount ave. to Broadway (incomplete)	24,936	sq. yds.
Total	28,218	sq. yds.

NEW SHEET ASPHALT.

Baltimore st., Kenwood ave., eastern city limits (incomplete)	5,896	sq. yds.
St. Paul st., North ave. to Twenty-fifth st	6,016	sq. yds.
Fulton ave. and Pennsylvania ave	36	sq. yds.
Total	11,948	sq. yds.

NEW GRANITE BLOCKS.

Maryland ave., Twenty-fifth to Twenty-ninth sts., (to complete)	4,334	sq. yds.
Hanover st., Fort ave. to Winder st	8,519	sq. yds.
St. Paul st., North ave. to Twenty-fifth st., (new)	662	sq. yds.
Boston st., over culvert, (new)	320	sq. yds.
St. Paul st. and Hamilton st., (new)	104	sq. yds.
Total	13,939	sq. yds.

STREETS PAVED BY ASSESSMENT.

During the year one street paid for by assessment and begun in 1901 was completed, four others were begun and completed, one was begun and not completed, contracts were let and assessments made up on eight others, and one, on which the assessments were made up in 1900, has not yet been collected. The assessments on all but one of these will probably be collected during the winter, so that the work can be begun early in the spring on all of them. Following is a detailed statement of the cost of those completed and the state to which the others have advanced:

MARYLAND AVENUE, from Twenty-fifth to Twenty-ninth streets, was paved by assessment with GRANITE BLOCKS on sand foundation under authority of Ordinance No. 73, of 1901. Grading was begun on October 21, and the paving on November 4, 1901. The work was done by the Filbert Paving & Construction Company, under their contract dated March 15, 1901. The company asked to be allowed to begin work in advance of the collection of the money, which was done; the work was completed on June 12, 1902, and is guaranteed for five years from that date. The following is the total cost of the work:

Final Estimate.

Belgian block paving	8,631.5 sq. yds.	at	$1.99..	$17,176 68
" " repaving	18.4 "	at	.97..	17 84
New flagstones set	2,759.5 sq. ft.	at	.37..	1,021 02
New 4½ in. curb set	2,978.2 lin. ft.	at	.72..	2,144 30
Curb reset and redressed	728.7 " "	at	.14..	102 02
Curb reset	15.6 " "	at	.10..	1 56
Extra grading	3,032.2 cu. yds.	at	.20..	606 44
Flagstones set	72.2 sq. ft.	at	.07..	5 05
Concrete under gutter	17.0 sq. yds.	at	.50..	8 50
Total				$21,083 41
Less old cobble purchased, 18,423 sq. ft. at $.00¼				46 06
Net cost of the paving, etc.				$21,037 35
Advertising, inspection, etc.				360 19
				$21,397 54

Of the above amount $20,756.72 has been paid, leaving $640.82 yet to be paid the contractor when the money is collected. The collection of this money has been delayed on account of injunction proceedings begun December 9th, 1901. The accounts to which the amount paid has been charged is as follows; $6,459.72 to paving Maryland avenue, in 1901; $1,214.97 to cross streets 1901; $2,780.24 to cross streets "Special" 1902; $9,954.81 to paving Maryland avenue in 1902; and $346.98 to extra grading on Maryland avenue in 1902. The amount paid by the property holders is $16,414.53 and the amount still to be paid is $640.82.

East Baltimore Street, from Grove street to the eastern city limits, is being paved by assessment with sheet asphalt, under Ordinance No. 91, approved December 21, 1900. Grading was begun in March and the paving in June, 1902. Owing to the construction of a large sewer in the bed of the street, the pavement has not been laid from the west side of Hare street to the east side of Canton street. A large part of the material for this stretch is on the street, and the work will be completed as soon as the weather will permit. The work is being done by the Southern Asphalt Paving Company, under their contract dated March 15, 1901. Six-inch granite curb was set on both sides of the street, and gutters of Mack block on concrete laid next to the same. The pavement has a two-inch wearing surface of Bermudez sheet asphalt and a one-and-a-half-inch binder coat. The six-inch concrete foundation is composed of one part "Atlas" cement, four parts sand and seven parts broken stone. The work, except as noted above, was completed on September 18, 1902. The work is guaranteed five (5) years from the date of completion. The cost of the work, so far as completed, is as follows :

Fifth Estimate.

Grading	4,640 cu. yds.	at	$ .39..	$ 1,809 60
New 6-inch curb	1,940 lin. ft.	at	1.00..	1,940 00
Vitrified brick gutters	305 sq. yds.	at	2.30..	701 50
Sheet asphalt pavement	4,727 sq. yds.	at	2.17..	10,257 59
4½-inch headers	255 lin. ft.	at	.60..	153 00
Cobble repaving	827 sq. ft.	at	.04..	33 08
				$14,894 77
Less 10 per cent. retained				1,489 48
Amount paid contractor in 1902				$13,405 29
Advertising, inspection, etc				427 84
Total amount paid to Dec. 31, 1902				$13,833 13

Of this amount, $11,320.30 was charged to paving East Baltimore street; $1,501.09 to paving and repairing cross streets; $579.02 to paving in front of city property, and $432.72 to paving in front of city property "Special." The total amount paid by the property holders is $15,825.72.

Chesapeake Street (now Kenwood avenue), from the north side of Fairmount avenue to the south side of Fayette street, was paved by assessment with Maxwell wire-cut vitrified blocks on a sand base. The work was done under Ordinance No. 119, approved April 26, 1901. The brick stood a test of 23 per cent. loss in the rattler. The gutters are laid on a four-inch concrete base and grouted. The work was begun on July 18 and completed August 23, 1902, and is guaranteed for five (5) years from the latter date. The work was done by F. E. Schneider & Company, under their contract dated June 20, 1901.

Final Estimate.

Vitrified brick paving	2,023.9 sq. yds.	at	$1.45..	$2,934 65
New 5-inch curb	862.7 lin. ft.	at	.70..	603 89
Extra grading	2,136.0 cu. yds.	at	.18..	384 48
Cobble repaving	185.9 sq. ft.	at	.05..	9 29
Amount paid contractor				$3,932 31
Advertising, inspection, etc				197 27
Total cost				$4,129 58

The total amount assessed against the property for this street was $3,797.92. The amount collected was $3,694,38. The difference of $103.54 is the amount assessed against a lot at the southeast corner of Fayette and Chesapeake streets, and has a frontage of 22 feet 1 inch on the latter street, and on the advice of the City Solicitor was not collected. The cost of the work was charged as follows: $3,694.38 to paving Chesapeake street, and $435.20 to cross streets, 1902.

Bayard Street, from Columbia avenue to Herkimer street, was paved by assessment under Ordinance No. 138, approved May 14, 1901, with asphalt blocks on 4-inch concrete base and ½-inch mortar bed. The concrete was made of one part "Patapsco" (slag) cement, two parts sand and five parts broken stone. The mortar bed was made of one part "Patapsco" cement and three parts sand and the blocks were laid in it at once. The asphalt blocks, 3x4x12 inches, are of Trap Rock and Trinidad Lake Asphalt. After the blocks were laid, they were grouted with one part Portland cement and one part sand. Work was begun on June 12, 1902, and completed July 26, 1902, and is guaranteed for five (5) years from the latter date. The Maryland Pavement Company, Contractors.

Final Estimate.

3,288	sq. yds. asphalt block paving	at $2.50		$8,220 00
1,170.8	lin. ft. new 5-inch curb	at .75		878 10
98.0	" " old curb reset (headers)	at .10		9 80
29.0	" " " " redressed in place	at .10		2 90
46.5	sq. yds. Belgian block repaved	at .30		13 95
4.3	" " " " on concrete	at .80		3 44
48.3	" " cobble repaving	at .30		14 49
	Total cost of paving, etc			$9,142 68
	Advertising, $35.47; rebate on assessment, $26.78			62 25
	Engineering, inspection, etc			201 83
	Total cost of the work			$9,406 76

Of the above amount, $3,466.97 was paid for by the property holders on the northeast side of the street, $4,926.92 was paid out of the fund for paving in front of city property (opposite Carroll Park), and $1,012.87 was paid out of "Cross Streets."

Collins Avenue, from the south side of Frederick road to a point 617 feet south (Walrad street), was paved with six inches of Macadam for a width of 20 feet in the centre of the street, and five foot gutters were paved on either side of the street with Maxwell tiles in the centre and cobble rebuts. The work was paid for by assessment on the property under Ordinance No. 129, approved May 3, 1901. Grading was begun on May 13 and work completed on August 18, 1902. The work is guaranteed for two years from the latter date. The work was done by Daniel Sullivan, under contract No. 682, dated September 20, 1901. The Macadam consists of a four-inch layer of gneiss stone to pass a two and one-half inch ring; on this a two inch layer of gabbro stone, size to pass through a one-inch ring. The sub-foundation was thoroughly rolled and each layer was thoroughly rolled with a steam roller. The cost of the work is as follows:

Final Estimate.

Macadam pavement	1,397	sq. yds.	at	$.74	$1,033 78
Brick and cobble gutters	659	"	at	.87	573 33
Grading	473	cu. yds.	at	.30	141 90
Cobble paving in alley	29	sq. yds.	at	.63	18 27
6 in. terra-cotta pipe	86	lin. ft.	at	.15	12 90
Belgian block repaving	19	sq. yds.	at	.36	6 84
Flagstone crossings	415	sq. ft.	at	.33	136 95
Flagstones set	26	"	at	.10	2 60
Total cost of the paving					$1,926 57
Less ten per cent. retained for two years					192 66
Amount paid contractor					$1,733 91
Advertising, inspection, etc					95 67
Total paid in 1902					$1,829 58

Of this amount $1,456.58 was charged to paving Collins avenue, and $373.00 to "Cross Streets." The $192.66 was charged to paving certificates. The total amount collected from the property owners is $1,649.24.

Augusta Avenue, from the south side of the Frederick road to the south side of Walrad avenue, was paved with six inches of Macadam for a width of 20 feet in the centre of the street. Gutters were paved 5 feet wide on either side with vitrified brick in the bottom and cobblestone rebuts. The work was paid for by assessment on the abutting property under Ordinance No. 128, approved May 3, 1901. Grading was begun on May 26th and the whole work was completed on July 21, 1902. The work was done by Daniel Sullivan under contract No. 682 dated September 20, 1901, and is guaranteed for two years from July 21, 1902. The Macadam and gutters were laid under the same specifications as for Collins avenue. The cost of the work is as follows:

Final Estimate.

Macadam pavement	1430.0	sq. yds.	at	$.74..	$1,058 20
Brick and cobble gutter	650.0	"	at	.87..	565 50
Flagstone crossings	420.0	sq. ft.	at	.33..	138 60
Flagstones reset	150.0	"	at	.10..	15 00
Grading	281.0	cu. yds.	at	.30..	84 30
Cobble paving in alley	13.3	sq. yds.	at	.63..	8 38
Belgian block repaving	16.7	"	at	.56..	6 01
Total cost of the paving					$1,875 99
Less 10 per cent. retained for two years					187 59
Amount paid to the contractor					$1,688 40
Advertising, inspection, etc					131 53
Total paid in 1902					$1,819 93

Of this amount $1,448.89 was charged to paving Augusta avenue; $371.04 to "Cross Streets," 1902, and the $187.59 to paving certificates. The total amount collected from the property owners was $1,636.48.

Eutaw Place, from North avenue to Whitelock street, is to be paved with 3-inch asphalt blocks on a 4-inch concrete base, under Ordinance No. 70 of 1900. The contract, No. 615, was let to the Maryland Pavement Company in September, 1900. Assessments were made up in October, 1900, but collections were delayed by an appeal to the City Court, and the money was not all paid in till December, 1902. The assessment is at the rate of $6.3917 per front foot, making the total amount paid in by the property owners $14,632.90. The estimated amount to be paid in by the city is $700. The amount spent for advertising in 1900 and charged to this street is $52.16.

Ashland Avenue, from the west side of Patterson Park avenue to the east side of Chester street, is to be paved with 3-inch asphalt blocks on 4-inch concrete base and one-half inch mortar bed. The work is authorized by Ordinance No. 21, approved January 13, 1902. The contract, No. 728, was let to the Maryland Pavement Company. Assessments were made up in July, 1902, and the money collected in December, 1902. The amount paid by the property owners is $6,906.33. The estimated amount to be paid by the city is $3,000. The amount spent for advertising, etc., is $60.94.

Fayette Street and the Philadelphia Road, from Luzerne street to Patapsco street, was directed to be paved with cobblestone under Ordinance No. 27, approved January 31, 1902. A contract, No. 738, was awarded to Patrick Keelty to do the work; assessments were made up in June, and the owners of the property notified of the amount of their assessments. The total amount assessed was $1,870.23 and the estimated amount for the city under this ordinance

was $725.00. On September 22, 1902, an ordinance was introduced to revise the amount of the work to be assessed against the property owners. The amount spent for advertising, etc., on this street is $52.85.

Brunt Street, from the southeast side of Baker street to the northwest side of Bloom street, is to be paved with cobblestone pavement under Ordinance No. 49, approved May 1, 1902. A contract (No. 751) was awarded to Daniel Sullivan to do the work. Assessments were made up in August and are now in the hands of the Tax Collector, and are due on January 20, 1903. The amount assessed against the property owners is $1,861 and the estimated amount of the city's portion is $300. The amount spent on the street for advertising, etc., is $82.78.

Montford Avenue, between Townsend and Gay streets, is to have the unpaved portion paved with cobblestone pavement under Ordinance No. 50 of May 1, 1902. A contract (No. 752) was awarded to Wm. M. Elder to do the work. Assessments were made up in August, 1902, and are now in the hands of the Tax Collector, and are due to be paid on January 20, 1903. The amount assessed against the property owners is $851.15. The estimated cost to the city is $200. The amount spent on the street in advertising, etc., is $51.97.

Carey Street, from Columbia avenue to Ward street, is to be paved with cobblestone pavement, under Ordinance No. 63 of June 6, 1902. A contract (No. 755) was awarded to Wm. M. Elder to do the work. Assessments were made up in September, 1902, and are now in the hands of the Tax Collector, and are due to be paid on February 20, 1903. The amount assessed against the property owners is $882.23 and the estimated cost to the city is $500. The amount spent for advertising, etc., is $60.45.

Henry Street, from Warren avenue to Hamburg street, is to be paved with Belgian blocks, under Ordinance No. 60 of June 6, 1902. A contract (No. 757) was awarded to the Filbert Paving and Construction Company to do the work. Assessments were made up in September, 1902, and are now in the hands of the Tax Collector, and are due to be paid on February 20, 1903. The amount assessed against the property owners is $1,038.58. The estimated cost to the city is $100. The amount spent for advertising, etc., is $49.84.

Rose Street, from Fayette street to Fairmount avenue, is to be paved with cobblestone, under Ordinance No. 62 of June 6, 1902. A contract (No. 754) was awarded to Ferguson & McCulloh to do the work. Assessments were made up in September, 1902, and are now in the hands of the Tax Collector, and are due to be paid by February 10, 1903. The amount assessed against the property holders is $1,407.67. The estimated cost to the city is $200. The amount paid for advertising, etc., is $76.63.

Calvert Street, from the south side of Baltimore street to the north side of German street, is to be paved with creosoted wood blocks on a concrete base at the expense of the property owners, under Ordinance No. 72, of June 19, 1902. The contract (No. 747) was awarded to the U. S. Wood Preserving Company on July 16, 1902. Assessments were made up and are now in the hands of the Tax Collector and most of the money has been paid in. The total net assessment on the property is $3,069.02. The estimated cost to the city is $150. The amount spent for advertising, etc., is $54. By the terms of the ordinance, the contractor is required to purchase the old Belgian blocks. By letter dated August 5th, 1902, the contractor agrees to sell these blocks to the city at the rate of two cents (2c.) per square foot which they bid.

PAVING PARK AVENUE.

On July 21, Mr. Michael Jenkins made a deposit of $3,700 (of which $464.05 was refunded), for the paving of Park avenue, from the north side of Centre street to the south side of Monument street. Proposals were advertised for and only one bid received, that of C. A. Hook & Co., on August 6, which was rejected because the prices were too high. The work was then done by the city and carried to the north side of Monument street and to the gutter at Centre street. The total area covered by concrete is 1,978.4 sq. yds., and by vitrified bricks, exclusive of the street railway rails, is 1,890.4 sq. yds. The pavement is laid on a 4-inch concrete base, composed of 1 part Atlas Portland cement and 3.5 parts sand and 6 parts broken stone. "Iron Rock Blocks," from Canton, O., were used. The joints were grouted with Portland cement and sand in the proportions of 1 to 3. A joint next to the curb was filled with No. 4 coal-tar heated to a liquid. Unfortunately the cars were allowed to run over the tracks before the concrete was set, so that the work along the rails is not so firm as it should be.

All of the curb on the east side was reset and a part on the west side. About 40 sq. yds. of asphalt blocks in Monument street were relaid to conform to the grade of Park avenue, and the gutter in Centre street was repaved. The cost of the extra work was $39.25; the cost of the curb was: Hauling 151 feet, $15.10; dressing, $39.40; resetting 790 feet, $83.64. The cost of the vitrified brick pavement proper was as follows:

VITRIFIED BRICK PAVEMENT.

Items.	Total Cost.	Cost per sq. yd.
Inspector, $66; advertising, $16.89.....	$82 89	$ .0438
Watchman, $72.83; counting brick, $9.58.....	72 83	.0436
Grading:		
Removing cobble, grading and cleaning up.....	294 56	.1556

Concrete:		
112 cu. yds. sand at $.55	61 60	.0326
186 " " stone at $1.65	306 89	.1623
774 bags Portland cement at 32c	247 67	.1310
Laying and mixing	178 06	.0942
Paving:		
80,872 brick at $24.00	1,940 93	1.0267
Hauling brick at $1.60	129 40	.0684
Labor, laying brick on one-half-inch sand	293 01	.1550
98 cu. yds. sand cushion at 75c	73 50	.0394
Grouting:		
14 cu. yds. screened sand at 80c	11 20	.0059
125 bags Portland cement	40 00	.0211
Coal tar, $11.72; charcoal, $1.20	12 91	.0068
	$3,755 03	$1.9868

The total cost of the work was $3,932.43, of which $3,235.95 was paid by Mr. Jenkins, and the balance of $696.48 was paid by the city and charged to "Cross Streets."

The actual amount saved on the cost of the paving over what it would have cost by contract is $562.36.

IMPROVED PAVEMENTS.

The sum of $149,604 was appropriated in the levy of 1902 for paving certain streets with improved pavements, and $4,000 was appropriated from the Contingent Fund, making in all $153,604. The streets and kind of pavements were set forth in the levy ordinance. Bids were solicited and opened in February, 1902, for all this work, and all were rejected on account of high prices, except for Hanover street. New proposals were received and opened on April 30, 1902, at lower prices, and contracts were awarded. Three of the streets have been completed, and another is about 88 per cent. completed and four others are under contract; but no work has been done, except that surveys have been made. The total amount spent out of the above two funds this year

for improved pavements is $84,384.09. The following detailed statement for each street gives the cost of the work done:

East Baltimore Street, from Kenwood avenue to Grove street, was one of the contingent streets to be paved with sheet asphalt out of the amount set aside for improved pavements in the levy. The portion of Baltimore street east of Grove street was to be paved by assessments which was paid in, and on account of the grade having been raised at Grove street it was necessary to pave the portion from Kenwood avenue to Grove street at the same time. In order to do this $4,000 was appropriated out of the Contingent Fund, and the street paved. The contract (740) for the work was let to the Southern Asphalt Paving Company on May 17, 1902. The work was begun in June and accepted September 11, 1902, and is guaranteed for five (5) years from this date. New 6-inch granite curb was set along Patterson park. The pavement has a 2-inch wearing surface of Bermudez sheet asphalt on a 1½-inch binder coat and a 6-inch concrete base. The concrete is composed of one part natural (Cumberland and Potomac) cement, three parts sand and five parts broken stone. Gutters of Mack blocks on concrete were paved along the curb. The cost of the work is as follows:

Final Estimate.

Sheet asphalt paving	1,169.2 sq. yds.	at	$2.25	$2,630 70
Vitrified brick gutters	92.3 sq. yds.	at	2.60	239 98
New 6-inch curb set	443.5 lin. ft.	at	1.10	487 85
Grading	1,106.0 cu. yds.	at	.23	254 38
New 4½-inch headers	35.7 lin. ft.	at	.65	23 20
Old headers reset	30.3 lin. ft.	at	.20	6 06
Cobble repaving	487.0 sq. ft.	at	.04	19 48
Curb reset and redressed	6.4 lin. ft.	at	.35	2 24
Total cost of the paving				$3,663 89
Less 10 per cent. retained for five years				366 39
Amount paid contractor in 1902				$3,297 50
Inspection				27 00
Total paid in 1902				$3,324 50

The whole of this amount, $3,324.50, was charged to the amount appropriated from the Contingent Fund for this street. The $366.39 was charged to Paving Certificates. $675.50 was returned to the Contingent Fund.

Hanover Street, from the north curb of Fort avenue to the north building line of Winder street, was paved with granite blocks on sand foundation and paid for out of the levy of 1902. The contract (No. 726) was let to the Filbert Paving and Construction Company on March 4, 1902. Work was begun on May 5 and completed on August 28, 1902, and is guaranteed for five (5) years from that date. A good, natural sub-foundation of sand and gravel was found and left undisturbed, so that the pavement should not settle unequally. The granite blocks are from Woodstock and Granite, Maryland. The cost of the work is as follows:

Final Estimate.

Belgian block paving	8,518.92 sq. yds.	at	$2.08..	$17,719 35
New 5-inch curb set	733.30 lin. ft.	at	.99..	725 97
Old curb redressed and reset	2,787.10 lin. ft.	at	.18..	501 68
Old curb redressed in place	105.60 lin. ft.	at	.22..	23 23
Old curb reset	24.40 lin. ft.	at	.10..	2 44
New flagstones set	870.50 sq. ft.	at	.34..	295 97
Old flagstones redressed and reset	1,652.00 sq. ft.	at	.07..	115 64
Old cobble-stone repaving	646.20 sq. yds.	at	.30..	193 86
Belgian block repaving	28.66 sq. yds.	at	.45..	12 90
Setting stepping-stones at Heath street				3 00
				$19,594 04
Less 6 days at $10.00 per day penalty				60 00
Amount paid contractor				$19,534 04
Inspection, etc.				342 36
Total cost of the work				$19,876 40

Of this amount $19,679.54 was charged to Hanover street and $196.86 to "Cross Streets." The amount originally set aside for this street was $19,429.00. By the omission of the word "hundred" after "four" in the ordinance the amount was reduced to $19,033.

A credit of $1,093.12 was made to Hanover street for the cobble taken up and used on repairs of streets, making the total amount available, $20,126.12; the balance of $446.58 was transferred to St. Paul street.

Saint Paul Street, from the south curb of North avenue to the north building line of Twenty-fifth street, was paved with sheet asphalt outside the street railway tracks, with vitrified brick (Mack blocks) gutters on cobble base next the curb and Belgian blocks on concrete for a width of 18 inches along outside of the rails. The Belgian blocks between the tracks were left as they were except near 25th street, 20th street and at North avenue, where they were relaid on account of the readjustment of the tracks. The sheet asphalt pavement consists of a 2-inch wearing surface of Bermudez asphalt and a 1½-inch binder coat on a foundation of cobble stone laid in sand. The cobble stones were taken up and relaid at such an elevation as to be 3½ inches below and parallel to the finished surface after being covered with sand and thoroughly rammed. On the east side, across 20th street, the sand covering was omitted, the cobblestone being rammed into the sand bed, and the binder put on this foundation in this way as an experiment to determine whether the sand covering is an advantage or not. The work between the tracks and two feet outside at North avenue and 25th street was done at the expense of the railway company, and bills sent them under authority of the curve ordinance of 1901, and the original ordinance for the North Avenue Railway Company. The work was done under the authority of the Ordinance of Estimates for 1902. The contract (No. 739) was awarded the Southern Asphalt Paving Company on May 8, 1902. Work was begun on July 21 and completed November 19, 1902, and is guaranteed for five (5) years from December 17, 1902. The cost of the work is as follows:

ST. PAUL STREET.

Final Estimate.

Sheet asphalt pavement	6,016.0	sq. yrds.	at	$2.08	$12,513 28
Vitrified brick gutters	650.5	"	at	2.09	1,359 55
Belgian blocks on concrete	291.7	"	at	2.60	758 42
Belgian block repaving	573.8	"	at	.70	401 66
Vitrified brick on concrete	15.7	"	at	2.60	40 82
Cobblestone repaving	388.0	"	at	.40	155 20
New 5-inch curb and circles	1,272.0	lin. ft.	at	.90	1,144 80
Old curb reset	912.3	"	at	.20	182 46
Old curb and circles red'r. and reset	1,362.5	"	at	.30	408 75
Old curb redressed in place	57.9	"	at	.15	8 68
Old curb reset as headers	516.7	"	at	.30	155 01
Belgian blocks on sand in railway tracks	370.0	sq. yrds.	at	2.10	777 00
Granolithic footway and gutters					61 79
Extra work not in contract					99 25
Total cost of the paving					$18,066 67
Less 63 days at $10 per day penalty					630 00
					$17,436 67
Less amount to be paid by railway company					943 36
City's portion of cost of paving					$16,493 31
Inspection and engineering					591 33
Total cost to the city					$17,084 64

The appropriation for St. Paul street was $14,606.00. To this amount was added credits as follows: From Hanover street, $446.58; from North avenue, $571.25; from repairs of roads, streets, etc., for vitrified brick, $350.63, making a total of $15,974.46. This latter amount has been paid and there is yet a balance due the contractor of $1,110.18 which is to be paid from the contingent fund for 1903, and later returned from balances from other streets. The original price bid for the sheet asphalt on concrete base for this street was $2.25 per square yard as against $2.08 for the pavement on cobblestone foundation, a difference of $.17 per square yard. The cobble stone on the street are worth more to the city than this difference, with the cost of hauling added for repairing cobble paved streets, so that it would be

better economy as well as giving a better foundation to use concrete on any street where the cobblestone have to be taken up and relaid. On a street where there are no tracks and where the surface of the cobble is in fair condition, there would be a small saving in the cost to lay the asphalt on the cobble rather than lay a new concrete base.

East North Avenue, from Greenment avenue to Broadway, is being paved with asphalt blocks on a concrete base under authority of Ordinance of Estimates for 1902. A contract (No. 730) was awarded to John L. Robertson on May 9, 1902, to do the work. A beginning was made on June 6 and was continued up to December 23, when it was stopped by freezing weather. The best of the old curb was redressed and reset, and such of the rest as was suitable was used for headers in the cross streets and new curb supplied where necessary. The 5½-inch concrete foundation is composed of one part slag (Patapsco) cement, three parts sand and five parts broken stone. On this is spread a ½-inch mortar bed composed of one part slag cement and three parts sand, in which the asphalt blocks are laid before the cement sets. The specifications require that the asphalt used in the blocks shall not contain more than .25 of 1 per cent. of salts soluble in water, nor more than that amount of organic matter acted upon by water. The size of the blocks specified was 5x12x4 inches deep. In order not to delay the work 4x4x12 inches were allowed on part of the street. Directly after the blocks laid, the joints are grouted with neat Portland cement. The work has been completed from Greenmount to Harford avenues, and all east of Harford avenue between the south curb and the north rail of the south track, and from the east rail on Harford avenue to Broadway. The United Railway & Electric Company laid new 9-inch girder rails on both tracks from Greenmount avenue to Broadway in advance of the pavement. The amount and cost of the work done to December 23, 1902, is as follows:

EAST NORTH AVENUE.

Seventh Estimate.

Asphalt block paving	24,936 sq. yds.	at	$2.42..	$60,345 12
New 5-inch curb set	2,000 lin. ft.	at	1.00..	2,000 00
Curb redressed and reset	4,700 lin. ft.	at	.28..	1,316 00
Old curb set for headers	700 lin. ft.	at	.15..	105 00
Cobble repaving	6,200 sq. ft.	at	.04..	248 00
				$64,014 12
Amount retained				17,510 41
				$46,503 71
Inspection, etc				668 30
Total paid in 1902				$47,172 01

Of this amount, $322.67 was for paving in front of Engine House No. 19, and charged to paving in front of city property, and $46,849.34 was charged to paving East North avenue.

Appropriations were made and contracts awarded on May 9, 1902, to John L. Robertson to pave four other streets with ASPHALT BLOCKS, as follows. No work has been done on these streets:

FULTON AVENUE, from the southwest curb line of Pennsylvania avenue to the northeast side of Druid Hill avenue; appropriation, $19,000.

WARREN AVENUE, from the east building line of Light street to 1,380 feet eastward thereof; appropriation, $20,300.

MCCULLOH STREET, from the northwest curb line of Lanvale street to the southeast building line of Lafayette avenue; appropriation, $4,000.

NORTH AVENUE, from the southwest curb line of Pennsylvania avenue to 150 feet westward thereof; appropriation, $2,424.

PAVING AND REPAIRING CROSS STREETS.

The total amount spent out of this account under my direction is $6,556.14. Of this amount $4,586.54 was spent for work in cross streets in connection with the paving of assessment streets, etc., as follows:

STREET INTERSECTIONS.

East Baltimore st., from Grove st. to Eastern city limits	$1,501 09
Bayard st., from Columbia ave. to Herkimer st	1,012 87
Park ave., from Monument to Centre sts	696 48
Chesapeake st., from Fairmount ave. to Fayette st	435 20
Collins ave., from Frederick road to Walrad st	373 00
Augusta ave., from Frederick road to Walrad st	371 04
Hanover st., from Fort ave. to Winder st	196 86
Total	$4,586 54

These amounts are noted under the reports of these streets.

COVERED GUTTERS.

During the first three months a small amount of work was done in connection with gutters covered with stone and iron, and the wooden shute at Bentalou street, and charged to "Cross Streets." The gutter on the southwest side of Bayard street, northwest from Columbia avenue, was extended across the entrance to Carroll Park and the bottom paved with brick. Two broken granite stone covers at Fayette and Front streets were replaced by Falls Road stone. The cost of the work is as follows:

Location.	Labor.	Material.	Total.
Columbia ave. and Bayard st	$52 40	$151 42	$203 82
Fayette and Front sts	20 84	38 00	58 84
McHenry and Bentalou sts	23 32	7 14	30 46
Centre and Charles sts	7 50	3 41	10 91
Caroline and Aliceanna sts	5 83	2 41	8 24
High and Granby sts	7 16	.....	7 16
Howard and Camden sts	3 13	.....	3 13
Pratt and Paca sts	2 09	.....	2 09
Pratt and Eutaw sts	2 08	.....	2 08
Miscellaneous	13 11	7 03	20 14
Total	$137 46	$209 41	$346 87

MISCELLANEOUS.

In connection with the paving of the footway on the north side of Patterson Park, a charge of $15 was made against "Cross Streets." In connection with the paving of Augusta avenue, at Walrad street, a ditch was dug at a cost of $17.47 and charged to this account. The Belgian block gutter at Postoffice avenue and Water street was repaired at a cost of $19.08, making a total of these items $51.55.

FOOTWAY REPAIRS.

Repairs to footways at street intersections was done as heretofore by one bricklayer and one carter. The repairs vary, from replacing a few loose brick to repaving an entire intersection, but in a large majority of the cases the repairs are small, the average being 33.5 square feet. Repairs were made at 817 places scattered over the entire city. The total area paved with new brick was 5,307 square feet, and the area paved with old brick is 27,373 square feet, making a total of 32,680 square feet. The average cost of labor for both kinds is 3.8 cents per square foot. The total cost of the work is as follows:

Labor, grading, paving, etc	$1,234 53
1,850 No. 1 brick at $10.50 per M	19 44
27,228 No. 2 " at 6.50 " "	231 44
120.8 cu. yds. sand at .71	85 77
Total	$1,571 18

The material left over in the city yard and charged to this account is:

22 cu. yds. sand at $.71	$15 62
850 No. 1 brick at 10 50	8 93
225 No. 2 " at 8 50	1 91
Total	$26 46

PAVING AND REPAVING OF CROSS STREETS

(SPECIAL.)

On account of the work on Maryland avenue, from 25th to 29th streets, not having been completed in 1901, the sum of $2,780.24 from the "Cross Streets" fund of 1901 was carried forward and used in paving the intersecting streets along Maryland avenue, as noted under the report for this street.

REPAIRS OF ROADS, STREETS, ETC.

The small amount of work done under my direction and charged to this account was $311.46. In connection with repairs to footways where the owners failed or refused to make the repairs, the work was done by the city and charged to this account and assessments made up for the Tax Collector. A few other repairs were made as noted below, and repairs to improved pavements amounting to $139.48, which are reported by Mr. Patterson.

Footway Assessments.

Footway S. W. corner Monument and Aisquith sts	$ 4 27
" S. W. " Preston and Linden ave	72 26
" west side Allen, near Fort ave	19 95
" 727 Gorsuch ave	29 30
" 1013 N. Front st	4 11

Miscellaneous.

Franklin st. and Gywnn's Run, stone	3 18
Caroline and Lanvale st., footway	6 86
759 Pennsylvania ave., footway	4 90
Falls Wall, rear of 522 N. Front st	14 81
" " south of Preston st	2 92
Sundry small repairs	9 42
	$171 98

In addition to the above, the sum of $1,443.75 was credited to improved streets for the old cobblestone, gutter stone and

curb taken up and used on repairs of roads, streets, etc. This amount was spent as follows:

Hanover street	$ 646 54
St. Paul street	797 21
	$1,443 75

This makes the total spent from this fund under my direction, $1,755.21.

PAVING IN FRONT OF CITY PROPERTY.

The appropriation for this purpose was $8,500. Of this amount $6,238.15 was spent during 1902, leaving a balance of $2,261.85, which was not used on account of certain assessment streets not having been done during the year. The amounts spent were as follows:

Asphalt block pavement and curbing on Bayard street, opposite Carroll Park, as noted under that street, $4,926.92.

Sheet asphalt pavement and curbing on East Baltimore street, opposite Patterson Park, as noted under that street, $579.02.

Asphalt block pavement on East North avenue in front of Engine House No. 19, as noted under that street, $322.67.

Brick footways on East Baltimore street, opposite Patterson Park, as noted below, $409.54.

FOOTWAY NORTH SIDE PATTERSON PARK.

Items.	Cost.	Cost per sq. yd.
Grading, 27 cu. yds. at 25c	$ 6 75	$.0012
Cinders, 10 loads at 55c	5 50	.0010
Sand, 46 cu. yds. at 75c	48 00	.0088
Brick, 23,450 No. 1 at $10.50 per M	246 22	.0452
Paving, 605.1 sq. yds. at 14c	84 71	.0155
Inspector, $12.00; hauling, $6.36	18 36	.0034
	$409 54	$.0752

PAVING IN FRONT OF CITY PROPERTY (Special).

The sum of $432.72 was carried forward from the fund of paving in front of city property, 1901, and applied to the pavement on East Baltimore street, east of Grove street, opposite Patterson Park, as noted under that street.

MAINTENANCE OF PROPERTY YARD.

A large shed for bridge tools and supplies was built at the city yard under my direction at a cost of $127.54. The roof is covered with roofing pitch and is guaranteed for five (5) years by H. Noble & Co.

EXTRA GRADING ON MARYLAND AVENUE.

After the contract for paving Maryland avenue, from Twenty-fifth to Twenty-ninth streets, had been let in 1901, it was decided to raise the grade line from Twenty-eighth street to Twenty-ninth street, and an appropriation of $1,330 was made in the levy for 1902 to pay the cost of the work and to continue the fill across Twenty-ninth street. A large part of the fill, however, was made with ashes and earth at slight cost, so that the amount spent was only $528.98, leaving a balance of $801.02.

CALVERT STREET GRADING.

Calvert street, from Twenty-fifth street to Gilmore lane, was deeded to the city on condition that the city grade and curb the street. The sum of $2,750 was appropriated out of the Contingent Fund to pay for the work. A contract (No. 734) was let to Patrick Keelty to do the grading at $ .29 per cubic yard, in connection with the filling on Twenty-ninth street. The curbing was not under my charge, and is reported elsewhere. The total amount of excavation on Calvert street was 5,621 cubic yards, and 204 on Twenty-ninth street, which, at $ .29, gives $1,689.25. Of this amount,

$1,277.25 was charged to Calvert street, $182.00 to extra grading on Maryland avenue, and $230.00 to grading Twenty-ninth street. The cost of engineering and inspection charged to Calvert street was $98.62, making a total of $1,375.87.

GRADING TWENTY-NINTH STREET.

Twenty-ninth street, from the west side of St. Paul street to the east side of Maryland avenue, was to be graded and curbed. The sum of $1,227 was appropriated in the Levy Ordinance to pay for this work. The contract (No. 734) for the grading was let to Patrick Keelty, in connection with grading on Calvert street, as noted above; the surplus excavation on Calvert street being hauled to Twenty-ninth street to make the fill. The amount spent under my direction and charged to this account was $38.76, for a drain-box across Twenty-ninth street, and $230.00 for grading, making a total of $268.76 and leaving a balance of $958.24.

PRIVATE PAVING AND INSPECTION.

The total amount spent under my direction and charged to this account is $1,180.82. The principal work was the setting of heavy curb and paving a vitrified brick platform on South and Cable streets for the Harbor Board. The curb at the southwest corner of Cable and South streets was ordered specially deep (30 inches) so as to keep the platform well above the street pavement. The rest of the curb was from 20 inches to 30 inches deep. The face of the curb on Cable street is 13 feet from the stone coping of the wharf, and on South street it is 9 feet. The curb was set on gravel, and the space between the curb and the stone wall was filled with cinders and gravel and thoroughly rammed as a sub-foundation for the brick pavement. On this sub-foundation a bed of sand 4.25 inches deep was spread, and on this vitrified bricks were laid and thoroughly rammed. The entire pavement was then grouted with one part Port-

land cement and two parts fine river sand, and thoroughly swept in till all the joints were entirely full. The pavement was then covered with sand to protect the grouting from the sun till it had set. The blocks were delivered in cars on the work. The area of the pavement is 453.47 sq. yds. The cost of the work and material is as follows:

Grading, Curb, and Setting Curb.

263 feet 8 inches 20-inch curb, at 60c	$158 20
137 feet 0 inches 30-inch curb, at 80c	109 60
20.5 loads sand and gravel, at 20c	4 10
Hauling, $5.50; cement, $1.02	6 52
Extra time stone cutter	18 00
Labor setting curb and grading	84 79
Total	$381 21

Vitrified Brick Paving.

Items.	Cost.	Cost per sq. yd.
Metropolitan blocks—20,000, at $24	$480 00	$1,058
Sand—58 cubic yards, at $.71	41 18	.091
Labor, unloading 20,000 blocks	15 00	.033
Labor, paving 453.47 square yards	68 02	.150
Total	$604 20	$1.332

Grouting and Covering.

Items.	Cost.	Cost per sq. yd.
10 bbls. Portland cement	$16.00	$ .0353
3 cu. yds. sand	2.13	.0047
Labor, grouting and covering	9.16	.0202
4 cu. yds. sand covering, ½-inch deep	2.84	.0062
	$30.13	$ .0664

One barrel of cement will grout 45 square yards, and one cubic yard of sand will grout 151 square yards. One cubic yard of sand will cover 111 square yards.

A small amount of work was done for the Building Inspector at No. 5 Truck House on Asquith street, where the gutter plates were extended at a cost of $27.85, and in front

of No. 6 Engine House, where the footways on either side of the driveway were paved with vitrified brick at a cost of $18.25.

The trusses carrying the conduits under Guilford avenue bridge were cleaned and painted for the Electrical Commission at a cost of $60.10.

The cost of inspector on improved pavement, laid for the United Railway and Electric Company along new tracks on Fulton avenue from Clifton street to Pennsylvania avenue, was $45.00.

Two small repairs were made to improved pavements from deposits made to this fund as follows:

Morton alley, rear of 1010 N. Charles street, permit No. 17,121, $2.00.

Front of 518 S. Broadway, permit $17,170, $12.00.

GUARANTEED PAVEMENTS.

The guaranteed pavements have been examined from time to time and the contractors notified to make repairs when necessary.

PAVING CERTIFICATES.

Following is a list of the streets on which the guarantee has expired during the year and on which the 10 per centum retained was paid to the contractor, with interest, as provided by law:

Street.	From	To	Certificate.	Interest.
Forrest street.....	Fayette.....	Lexington....	$ 227 50	$ 27 31
Patterson avenue...	Fremont....	Fulton avenue	3,095 95	619 19

Besides these, the retained amount on the following streets on which the guarantee has not expired was paid, with interest, from the completion of the work to the date of payment:

Street.	From	To	Certificate.	Interest.
St. Paul street.....	25th.....	30th	$2,913 40	$19 42
Bank lane.....	St. Paul....	Charles... ...	146 85	2 87
Bank lane.....	Calvert.....	St. Paul.....	100 06	2 11

Making a total of $6,483.76 for retained amounts and $670.90 for the interest on the same, and a grand total of $7,154.66.

MAINTENANCE OF BRIDGES AND CULVERTS.

The principal work in connection with maintenance of bridges was the cleaning and painting of eight (8) of the largest bridges and laying new floors on three (3) others. The new work done was the completing of the brick arch in place of the Boston street bridge and the replacing of the wooden floor on Lancaster street bridge by a floor of concrete and expanded metal, after experiments made at the City Yard with this kind of construction, and the replacing of a number of small wooden bridges and culverts with flagstone covers or terra-cotta pipe.

The total amount of money spent on bridges and culverts during the year is $27,895.85. This includes $2,221.72 brought over from the bridge fund of 1901, and $399.13 paid in by the P. W. & B. R. R. for Boston street arch; $275.00 from the Contingent Fund, and the Levy Appropriation of $25,000 for the year 1902. Of this amount 74 per cent. was for labor and 26 per cent. for material. 60 per cent. was for cleaning and painting the bridges, 15 per cent. for wooden floors and 25 per cent. for permanent work. It has been the policy to preserve the large and expensive bridges, to keep all of them safe and as fast as possible, to replace wood and iron structures with concrete or masonry when it is necessary to renew them. The following brief descriptions of the more important pieces of work gives the principal details :

Boston Street Arch, over the mouth of Harford Run sewer, was built of brick to replace a plate girder bridge with a wooden floor. The total length is 70 feet, span 26.55 feet, and rise of 7.52 feet above spring line and side-walls 21 inches above floor of sewer. The arch has four rings under

the footways, five under the roadways and six complete and seven partial rings (up to the top of the haunching) under the tracks of the P. W. & B. R. R. A detailed description of the method of construction appears on page 91 of the report of 1901.

Work was begun on September 18, 1901, and completed April 30, 1902. The railway track had to be kept in use, and the disadvantages of work in the winter increased the cost over what it would have been during the summer months. The grade of the street was raised 3.8 feet over the centre of the arch and carried out to meet the old grade at 440 feet to the west and 280 feet to the east. On account of the flat crown of Boston street, the P. W. & B. R. R. Co. raised their tracks in the center of the street for about 200 feet eastward of O'Donnell street to remedy the trouble from water and ice on the tracks. On account of these changes, and the fill involved, it was necessary to remove from the street and then repave 3,373 square yards of Belgian block pavement, to remove and reset 1,440 lineal feet of 6-inch curb, to take up and repave 3,460 square feet of brick sidewalk; and in addition to this, there was 320 square yards of new Belgian block paving and 2,665 square feet of new footway paving. The arch proper terminates at the south portal in a row of 18-inch ring-stones which have an average length of 15 inches in the direction of the axis of the arch. These stones were cut on the ground from part of the stone of the bridge seat of the old bridge. On account of the change of grade of the street, the retaining walls east and west of the arch were built up to the new grade. The total stone masonry, including the retaining wall and parapet at the south portal, is 230.6 cubic yards. The total brick masonry in the arch is 159.6 cubic yards.

The total cost of the arch and all the work in connection with the same was $7,880.66. Of this amount $3,474.56 was spent in 1901 and $4,406.10 in 1902. Of the latter amount $2,221.72 was paid out of the bridge fund of 1901, which

was brought forward for this work, and $2,184.38 was charges to bridges, 1902. By agreement, the P. W. & B. R. R. paid for 9 feet of the arch, which amounted to $399.13, and this amount was credited to bridges, 1902. Below is given in detail the total cost of the work:

Classification.	Cost.	Per Cent. of Total.
Toolhouse and fencing	$ 35 66	.005
Tearing out old bridge and excavation	438 97	.05
Foreman's wages	595 62	.08
Construction of derrick	164 34	.03
Grading, paving and repaving street	3,152 70	.40
Construction of centers	174 64	.02
Cutting skew-back on old walls	164 02	.02
Brick masonry, 159.6 cu. yds. at $8.49	1,355 09	.17
Stone " 230.6 " " " 7.38	1,702 94	.21
Ringstones at south portal	96 68	.015
	$7,880 66	100

St. Paul Street Bridge was painted over the tracks below the floor in 1900, so that it was not necessary to repaint this portion this year. The rest of the bridge had not been repainted since 1897. All the rest of the bridge was thoroughly cleaned and painted this year at a total cost of $5,216.08. The bottom cord bars of both trusses and all the metal work below the floor was painted with two coats of Princess Metalic Brown and linseed oil mixed on the work. All the iron work above the floor was painted with two coats of Carrara paint. The hand-rail, which is in bad condition from rust on the inside of the pipe work, was gone over and repaired as far as it could be, as were also a number of ornaments on the trusses. The original construction of the hand-rail was such that there is no means of effectually preventing the steam and gases from getting on the inside and rusting both the posts and pipes. This defect is most serious, as there is no means of cleaning and painting the inside of the posts and pipes.

Calvert Street Bridge was entirely cleaned and painted in 1897, except under the cast iron ornaments on outside of floor beams. The portion of the bridge below the floor of the north viaduct was cleaned and painted in 1901. During this year the cast iron ornaments on the outside of the floor beams under the entire bridge, which were not removed last year, were removed and the floor beams cleaned and painted with Etna Iron paint. The parts below the floor of the north truss (over the railroad) were cleaned and painted with Etna Iron paint. The first bent of the viaduct south of the south pier of the north truss was cleaned and painted with two coats of Dixon's Graphite paint, the next three bents with Detroit Graphite paint, and the rest of the south viaduct and the truss over Jones' Falls was painted with red oxide, made by the Carrara Paint Co. The cord bars of the bottom cord of both trusses were painted with Etna Iron paint. The entire bridge above the floor was cleaned and painted with two coats of Carrara paint.

South Monroe Street Bridge, which was built in 1891, was constructed with wooden roadways level in both directions, and no means for the dirt and water to run off the floor. It was necessary to renew both top and bottom floors this year, and they were entirely reconstructed with 2-inch bottom and 3-inch top floors so as to give them a fall of six inches towards the footways, and scupper holes were left for dirt and water to run off. The plank of the top floor on the west driveway was dressed to an even three inches in thickness, making the floor smooth. The east driveway was laid with the 3-inch planks just as they came from the mill (some varying as much as ½-inch in thickness). The two driveways have practically the same travel, so that this will be a test as to whether it is worth the additional cost, $2 per M ft. or 6c. per square yard, to have the roadway plank dressed. A part of the east footway was also renewed. Tearing up the three old floors cost $2.43 per M ft., or 9c. per square yard. Laying new lumber costs

$2.88 per M ft. The entire bridge was cleaned and painted with two coats of Carrara paint. The iron over the railroad tracks was very badly rusted and pitted, especially where the floor joined the truss. Labor for scaffolding and scraping cost 1.6c. per square foot of iron work, and labor painting costs 1.2c. per square foot. In November a car of the B. & O. R. R. struck the centre post on the south pier and bent it so that it will have to be taken out and renewed with a new post. This the railroad company is about to do.

Cedar Avenue Bridge was cleaned and painted with Princess Metalic paint in 1897 and was in fair condition, except over the railway tracks, which was in very bad condition. The entire bridge was cleaned and painted with Princess Metalic brown.

Guilford Avenue Bridge was cleaned and painted over the railway tracks and north of the same in 1900. This year the cleaning and painting was completed. The entire roadway floors and stringers were removed and reconstructed. The United Railways and Electric Company laid new 9-inch girder rails on new 12-inch by 12-inch timbers, with new double floor between tracks and two feet outside same. The city put in new stringers and new 2-inch bottom floor on its portion of the two roadways outside the tracks, and relaid the 3-inch top floor which was put down last year, and which was in good condition. The roadway floor was given a fall of four inches to the footways, and scupper holes left to allow dirt and water to run off. The cost of the work was increased considerably on account of the delay of the railway company in completing their portion. The extra cost of watchman on this account was $94.00. The footways were also repaired.

Wilkens Avenue Bridge was built in 1897 and painted with two coats of Graphite paint. It was entirely cleaned and painted this year with Dixon's Graphite paint. The

cost of labor for scaffolding and cleaning was 1.64c. per square foot, and for painting was .95 of one cent.

Maryland Avenue Bridge was cleaned and painted with Princess Metallic brown in 1898. A large part of the iron below the bridge was in good condition but was all again cleaned and painted with two coats of Princess Metallic brown. The hand-rail and trusses above the floor were in bad condition and were cleaned and painted with two coats of Carrara paint. The cost of labor for scaffolding and cleaning was 2.7c. per square foot, and painting was 1.5c. per square foot. The west roadway floor was reconstructed so as to bring it up level with the west rail of the street railway track and given a fall toward the footway. The lower floor was relaid and the top floor laid new.

Lancaster Street Bridge, over the open portion of the Central avenue sewer, was formerly constructed of 15-inch "I" beams, with a wooden floor. The bridge has a clear span of 22.8 feet and a total width of 50 feet. This bridge is in the lumber district and carries a large amount of travel, and the cost of maintaining the wooden floor and the deterioration of the "I" beams from the gases of the sewer led to the construction of a more permanent floor system with a brick pavement. Experimental slabs of concrete and expanded metal were made at the City Yard in August which showed that with "I" beams spaced 3 feet C to C a 6-inch slab would hold up 28 tons concentrated on 4 square inches, and that a 4-inch slab would hold up a concentrated load of 22 tons. From the results of these experiments it was decided to use 6-inch Portland cement concrete slabs, reinforced by No. 10 (3-inch mesh) expanded metal laid over the top of the "I" beams and depressed about 4 inches in the concrete between the "I" beams, which are spaced 37 inches C to C. The "I" beams were cleaned and coated with hot pitch and raised to the proper height. Thin expanded metal lathing was bent around the lower flange of

the beams and the centers so formed that the lower flange is protected by cement mortar, and the entire beam by concrete, and in such a way that a part of the load is transferred to the lower flange. The method of supporting centers by hook-bolts from the "I" beams and the other details are shown on the accompanying plan of the bridge. The concrete finished 1 inch above the top of the "I" beams and entirely covers all the metal. The mortar around the lower flange was made of one part "Atlas" Portland cement and two parts sand. This was thoroughly rammed under and around the lower flang. The concrete was made of one part "Atlas" Portland cement and two parts of clean, fine river sand and four parts crushed gneiss rock, run of the crusher up to 1½ inches. The concrete was well mixed and thoroughly rammed in thin layers until all the voids were filled with the mortar. This is an important operation in this kind of construction. The top of the concrete in the roadway floor is covered by a heavy coat of roofing pitch and on this a layer of sand, averaging two inches thick. On this is to be laid a vitrified brick pavement of Iron Rock blocks, the joints to be grouted with sand and Portland cement mixed one to one. The footways are to be paved with No. 1 paving brick on sand and cinders. The curbs along the driveway were also made of concrete 12 inches wide and of such a height as to show 5 inches above the brick pavement. The roadway edges are protected with 4-inch angle irons. The work was begun in November and is not yet completed, but the amount of all bills is known, so that the total cost may be reported at this time as follows:

Classification.	Total cost.	Cost per sq. ft.
Tearing out old bridge and cleaning up	$ 58 85	$.034
Raising and coating beams, centers	238 74	.132
Expanded metal	86 64	.050
Concrete floor and curb	476 70	.276
Pitch on roadway	35 00	.034

Vitrified brick pavement on roadway	141 96	.138
Footway pavements	18 10	.061
Repairs to handrail	35 42	....
	$1,091 41	

The total area of the bridge, out-to-out, is 1,727 square feet; the area of the roadway is 1,028 square feet; the footway is 296 square feet; number of cubic yards of concrete is 43.4. The amount paid in 1902 is $692.31, leaving $399.10 to be paid in 1903.

Pratt Street Bridge was cleaned and painted with Princess Metalic brown in 1897. Owing to the defective paving along the tracks of the United Railways and Electric Company, and of the B. & O. R. R., the water runs through on to the buckle plates and along the floor beams, and these were very badly rusted. In some places there were large scales of rust from ¼-inch to ½-inch thick on the floor beams. The old rails over the bridge should be replaced by new rails of special form and the pavement laid in such a way as to prevent the water from getting through to the iron, which it has already seriously damaged. The entire bridge was thoroughly cleaned, the part below the floor painted with Etna iron paint and that above the floor with Princess Metalic brown. The cost of labor for scaffolding and cleaning was 2.5c. and that of painting was 1.1c. per square foot.

Preston Street Bridge.—The wooden floors on both sides from the street railway tracks to the footway were in bad condition and laid level. The floors were entirely taken up and remodeled so as to bring the plank level with the street railway rail and have a fall of eight inches toward the footway, where scupper holes were left for the dirt and water to run off. Most of the stringers were replaced and new 2-inch bottom and 3-inch top floors were laid, the street railway company paying for the two feet outside their tracks. The

footways were repaired and the iron handrails cleaned and painted with two coats of Carrara paint.

Gay Street Bridge was cleaned and painted in 1897 with Princess Metallic brown below the floors and with white lead and oil above the floor. This year the bridge was cleaned and painted below the floor with Etna Iron paint and above the floor with Princess Metallic brown. The cost of labor for scaffolding and cleaning was 2c. per square foot and of painting .8c. per square foot.

Dead Run Arch was undermined by the washing away of part of what last year seemed to be a good foundation under the west abutment. This was underpinned and the rock channel above and under the arch cleared and enlarged. The depth of the foundation below ordinary low water and the large amount of water which had to be carried in a flume made the work difficult and expensive. The enlarged area of the opening at the south end of the arch is 124.4 square feet.

Block Street Drawbridge was maintained with less than usual expense. The 4-inch lead water service pipe laid last year and encased in cement seems to be an entire success. A platform was constructed around the draw pier, the hand gear to turn the draw put in good repair, and the west abutment, which each year has moved slightly towards the bridge, was anchored by bedding the ends of two 2-inch iron rods, one in a mass of concrete about 35 feet from the abutment and the other in a masonry wall about 32 feet from the abutment, and passing the other ends of the rods through the abutments and fastening them with large nuts and washers. The total number of times the draw was opened for vessels passing through the channel was 9,806. The number of teams passing over the bridge was 138,444.

Loney's Lane.—The old wooden culverts across Loney's lane were rotten and in bad condition, and were replaced by terra cotta pipes with stone head-walls. The culverts between

Oliver and Hoffman streets were replaced by three rows of 24-inch pipe 20 feet long, and heavy stone headwalls and short retaining walls. The ditches were cleared out and straightened. The wooden box culvert across Loney's lane, on the south side of Biddle street, was replaced with 40 feet of 18-inch terra cotta pipe. On the east side of Loney's lane, across Monument street, an 18-inch terra cotta pipe 80 feet long was laid.

The stone culverts with wooden floors on the Old York road, near Oak Hill avenue, Garrison Avenue, south of the P. W. & B. R. R. and on Friendship Lane were in bad condition. The stone sidewalls were repaired and stone flags laid in place of the wooden floors. The floors under the brick culverts on Morris Avenue, north of the Franklin road, were paved with stone. Twenty-eight other bridges and culverts were repaired and made safe.

There are a number of these which should be replaced by permanent structures as fast as the present wooden structures reach the point where they need to be renewed. Some of them will last in their present condition for two or more years, but there are some which should be renewed in 1903. Among the latter are the wooden bridge on Calverton road, over Gwynn's run, the Union avenue bridge over the mill-race, and a few smaller ones. The wooden floors of Canton avenue, Eastern avenue and Chase street bridges over Jones Falls should be replaced by Ferro-Concrete or other permanent floors and pavements.

During the year plans have been under consideration for replacing the old high wood and iron bridge on Edmondson avenue over Gwynn's Falls by an arch or arches and fill. These plans and estimates should be completed this year and the money provided for in the levy of 1904. This bridge is fast approaching the condition when it will have to be replaced or renewed to make it safe, and the expense of maintaining so large a wooden structure makes it desirable

that it should be replaced by arch and the large extra area filled in with earth.

The largest and most important iron and steel bridges were built prior to the year 1882, over a million and a quarter dollars having been spent for bridges prior to that year. The detailed plans for these bridges were made on manilla paper, which has become brittle with age and torn with handling. These plans are too valuable to be lost, so that the work of tracing them on tracing cloth has been begun, the more important ones being taken up first. It is also contemplated to make up plans for permanent floors for some of the bridges. The strains on such bridges as the present travel seems to indicate are over-strained, are being worked up.

The following table gives the cost of labor and material and general character of work done on each bridge:

Bridge.	Labor.	Material.	Total.
Argyle avenue—			
Repairs to footway	$ 7 91	$ 8 62	$ 16 53
Beech avenue—			
Repairs to roadway floor	6 17	.....	6 17
Biddle street—			
Repairs to sheet asphalt	7 50	.....	7 50
Bath street—			
Repairs to roadway floor	2 08	.....	2 08
Boston street—			
Completing brick arch, etc	3,098 34	1,307 76	4,406 10
Block street—			
Supplies	.....	41 77	
Repairs to machinery	30 37	12 23	
Platform around pier	56 63	34 40	
Anchors for abutment	71 10	19 41	
Repairs to roadway floor	4 42	4 49	
	$ 162 52	$ 112 30	274 82

Bridge.	Labor.	Material.	Total.
Canton avenue—			
Repairs to roadway floor	$ 7 29	$ 11 30	$ 18 59
Cedar avenue—			
Painting (princess metallic)	488 77	135 98	
Scraping and scaffolding	1,074 48	19 37	
Repairs to roadway floor	42 50	91 61	
" " handrail	2 00	2 95	
	$1,607 75	$ 249 91	1,857 66
Calverton road—			
Repairs to roadway floor	3 33	8 89	
Hauling stone for new arch	112 50	.....	
	$ 115 83	$ 8 89	124 72
Chase street—			
Repairs to footway	23 66	51 30	74 96
Central and Canton avenues—			
Repairs to roadway floor	2 33	1 80	4 13
Calvert street—			
Above the floor:			
Painting (carrara paint)	466 55	222 60	
Scraping and scaffolding	909 80	6 95	
Below the floor:			
Painting (etna, graphite and oxide)	699 07	300 56	
Scraping and scaffolding	1,346 80	47 49	
	$3,422 22	$ 577 60	3,999 82
Clipper Mill—			
Repairs	16 99	.....	16 99
Dorsey's Lane—			
Repairs to roadway floor	4 59	6 06	10 65
Dead Run—			
Underpinning wall and clearing channel	361 52	105 49	467 01

Bridge.	Labor.	Material.	Total.
Eastern avenue—			
Repairs to roadway floor	$ 23 94	$ 29 45	$ 53 39
Expanded metal—test	47 42	8 29	55 71
Franklin street—			
New top floor	14 99	29 42	
Painting and clean'g (metallic brown)	30 82	3 18	
Repairs to handrail	7 30	.....	
	$ 53 11	$ 32 60	85 71
Friendship avenue, 100 feet west Montebello avenue—			
Repairs to stone culvert	20 67	5 00	25 67
Fayette street—			
Repairs to roadway floor	15 31	19 13	34 44
Guilford avenue—			
Painting (carrara)	145 96	46 12	
Scraping and scaffolding	342 84	.....	
New bottom floor, stringers and repairs to footway	512 76	581 79	
	$1,001 56	$ 627 91	1,629 47
Gay street—			
Painting (etna and metallic brown)	185 50	26 60	
Scraping and scaffolding	484 32	2 13	
	$ 669 82	$ 28 73	698 55
Garrison Lane—			
Replacing wooden floor with flags	42 62	44 73	87 35
Hillen street—			
Repairs to roadway floor	10 43	.....	10 43
Harmon's—			
Repairs to bents	41 49	14 90	56 39
Jenkin's lane—			
Repairs to roadway floor	1 25	.....	1 25

Bridge.	Labor.	Material.	Total.
Kate avenue—			
Repairs to roadway floor	$ 83	....	$ 83
Loney's lane, across Monument street—			
Laying new 18-inch pipe	84 12	$ 46 91	131 03
Loney's lane and Biddle street—			
Laying new 18-inch pipe	27 84	19 43	47 27
Lexington street, over Gwynn's Run—			
Repairs to footway	5 83	.....	5 83
Loney's lane, 1,000 feet north of Biddle street—			
Sixty feet new 24-inch pipe and head-walls	111 80	104 28	216 08
Lancaster street—			
Ferro-concrete and vitrified brick floor	392 66	299 65	692 31
Miscellaneous	49 21	47 68	96 89
Morris avenue, Nos. 3 and 4—			
Paving floors under culverts	49 75	6 10	55 85
Maryland avenue—			
Painting (carrara and metallic brown)	300 64	. 121 37	
Scraping and scaffolding	559 52	49 65	
New roadway, west side	43 97	103 25	
	$ 904 13	$ 274 27	1,178 40
Madison street—			
Repairs to roadway floor	2 50	.....	2 50
Montebello avenue—			
Repairs to roadway floor	5 42	5 39	10 81
Monument street—			
Repairs to footway	12 49	17 92	30 41
Merryman's lane—			
Repairs to roadway floor	1 67	.....	1 67

Bridge.	Labor.	Material.	Total.
North Monroe street—			
Repairs to roadway floor	$ 42 92	$ 96 49	$ 139 41
Old York road and Oak Hill avenue—			
Repairs to side-walls and replacing wood floor with flagstones	77 45	76 22	153 67
Old Liberty road and Slingluff avenue—			
Repairs to roadway floor	1 25	2 16	3 41
Pratt street—			
Painting (etna iron and metallic brown)	262 76	52 42	
Scraping and scaffolding	580 81	31 27	
	$ 843 57	$ 83 69	927 26
Preston street—			
Cleaning and painting handrail	49 17	11 80	
Two new roadway floors, top and bottom	158 52	524 67	
Repairs to footway	4 59	7 54	
	$ 212 28	$ 544 01	756 29
Philadelphia road—			
Repairs to roadway floor	5 82	12 93	18 75
St. Paul street—			
Above floor:			
Painting (carrara paint)	821 38	322 22	
Scraping and scaffolding	1,303 26	6 67	
Below floor:			
Painting (princess metallic brown)	721 29	265 63	
Scraping and scaffolding	1,651 92	43 15	
Repairs to handrail and ornaments	56 00	20 89	
Taking up iron plates	3 67	.....	
	$4.557 52	$ 658 56	5,216 08
South Monroe street—			
Painting (carrara paint)	370 62	152 87	
Scraping and scaffolding	493 73	40	

Bridge.	Labor.	Material.	Total.
New top and bottom floors, both sides	$ 157 09	$1,263 39	
Tearing up old floor	101 71	.....	
Repairs to footway	30 43	92 51	
	$1,153 58	$1,509 17	$2,662 75
Union avenue, over Mill race—			
Repairs to roadway floor	2 83	5 39	
Hauling stone for new arch	75 00	.....	
	$ 77 83	$ 5 39	83 22
Union avenue, over Falls—			
Repairs to handrail and footway	40 97	19 63	60 60
Wilkens avenue—			
Painting (Dixon's graphite)	451 39	127 95	
Scraping and scaffolding	775 05	13 47	
Repairs to abutment	10 58	.....	
	$1,237 02	$ 141 42	1,378 44
			$27,895 85

LIGHT STREET DRAWBRIDGE.

This bridge, on account of its length of wooden floor (4,758 ft.) and the large amount of travel over it, is one of the most important and most expensive to maintain in the city. Nearly half of this expense is the salaries of the crew attending the draw. The next largest item usually is the renewal of the wooden roadway floor. This item, it was anticipated, would be somewhat less than in previous years, but that it would be only 26 per cent. of the average for the previous four years was not anticipated. This great saving in the cost of maintaining the roadway floor is almost entirely due to the change in the wheel-guard rail, as described on page 75 of report for 1900. By this change the bottom of the wheel-guard rail was raised about three inches above the floor of the bridge, so as to allow water to run off and the dirt to blow away. Previous to 1900 the life of the top floor

was three years, and about 1,600 lineal feet was renewed each year. Last year, however, the portion of the roadway laid in 1898 was in good condition until late in the season, and even then only 1,353 lineal feet of new floor was laid. This would leave over 2,000 feet to have been laid this year at the rate previous to the change; but instead only 810 lineal feet was laid, and, from present appearances, there will not need to be laid next year more than enough to finish the entire top floor in four years, thus adding 25 per cent. to the life of the top floor, as I think, from no other reason than this change in the guard-rail, beside the annual saving of about $300 to $400 in sawing plank to fit up to the guard-rail and the extra cost of sweeping the bridge. These facts also show the value of keeping a detailed account of the cost of the various items of work, in order that comparisons may be made and that we may know where savings can be made in the cost of maintenance. 810 lineal feet (32,700 B. M.) of new top floor was laid, and 125 lineal feet (5,000 B. M.) of the best of the old floor taken up was relaid.

A large part of the 2-inch footway floor is over eight years old, so that an unusually large amount had to be renewed this year. 1,059 lineal feet (14,830 ft. B. M.) of new footway floor was laid and 810 lineal feet (11,340 ft. B. M.) of the best of the old plank taken up was relaid. A part of the relaying is due to the fact that 1,142 lineal feet of footway joice (3,426 ft. B. M.) and 1,667 lineal feet of footway fender rail (3,853 ft. B. M.) were taken up and renewed with new lumber.

About 4,530 feet of the bridge are on piles which were sawed off below low water and capped. The posts of the trestle bents, which rest on these, are old, and are rotten just above the cap timbers. 178 of these posts were sawed off two feet above the cap, and a new piece put in and secured by two 2″ x 6″ x 5′ splices. This work had to be done from a raft and small boat at low water.

The piles, which carry the fender timbers around the draw pier, were many of them rotten off at the water line, and the timbers were rotten and broken. 55 of these piles were pulled up high enough to fasten the fender timbers to them, six others were pulled up and re-driven for two new piers along the bridge on which to pile lumber, and six new piles were driven to protect the crib work at the draw pier. New fender timbers were put on where necessary. Six piles shoved out of place by the ice last winter were pulled into place, and two that were broken off were renewed.

The engines and boilers have had about the usual amount of repairs. A small new force pump was purchased, to be used in filling the boiler when the injectors are out of order. The old shaft and bevel gear wheel arrangements for raising and lowering the end supports of the draw span were taken out and replaced by chain and sproket wheel arrangements, which are very much more satisfactory. Both boilers are now regularly inspected, and are insured for the sum of $10,000 for three years by the Hartford Steam Boiler Inspection and Insurance Company.

Slight repairs were made to the hand-rails and buildings. The engine house was painted.

On September 17 the four-masted schooner Orlando V. Wootten, in tow of the tug Sea King, ran into the engine house, tearing out one side and twisting the building. The owners made repairs promptly. The following table gives the travel across the bridge and through the draw for the year:

Travel Across Bridge.		Travel Through Draw.	
Double teams	129,763	Tugs	3,919
Single teams	119,269	Barges	2,279
Street cars	79,578	Schooners	690
Mail cars	7,610	Sloops	412
Funerals	1,138	Steamers	373

The total openings made is 5,766, or an average for the year of 15.8 per day. The average daily openings in June is 25.1.

The cost of maintaining the bridge is as follows:

	Labor.	Material.	
Engineer and bridge tenders	$3,189 02	.....	
Coal, $269.12: oil, nails, etc	.....	$390 59	
Repairs and renewals of roadway floors	175 27	528 12	
Repairs and renewals of footway floors	350 81	302 18	
Repairs to trestle work	215 68	188 62	
Repairs to machinery and boilers	123 51	255 18	
Fenders around draw pier	331 12	287 56	
New lumber piers	130 05	18 86	
Boiler insurance for three years	100 00	.....	
Repairs to buildings	28 37	49 50	
Repairs to handrails	63 68	8 48	
Sweeping bridge seven times	78 70	.....	
	$4,786 21	$2,029 09	$6,815 30

The appropriation for the year was $7,900 and the amount spent was $6,815.30, leaving a balance of $1,084.70. This is due to the small amount of lumber needed to maintain the roadway floor as explained above.

MAINTENANCE OF BLOCK STREET DRAWBRIDGE.

The appropriation of $1,350 under the above title is for the salaries for the Keeper and Assistant Keeper of Block Street Drawbridge. The repairs and maintenance proper are charged to Maintenance of Bridges and Culverts. The present method divides up the expenditures into two separate accounts. I would recommend that the accounts for maintaining Light Street and Block Street Drawbridges should be included in the general appropriation for Maintenance of Bridges and Culverts, as there is no more reason for singling these two bridges out for separate appropriations than any of the other large bridges. A few years ago there were separate appropriations for St. Paul Street, Calvert Street and Harmon's bridges, and it was found better to combine these in the general fund.

RECAPITULATION.

The following summary of the foregoing detailed statements brings together the totals spent for improved pavements, bridges, etc., and the amounts spent out of the various appropriations under my direction:

Improved pavements charged to Levy Ordinance		$81,059 59
" " " " Assessments		35,119 50
" " " " Cross Streets		4,586 54
" " " " Cross Streets (special)		2,780 24
" " " " City Property		5,828 61
" " " " City Property (special)		432 71
" " " " Roads, Streets, etc		1,443 75
" " " " Contingent Fund		4,238 71
" " " " Paving Certificates		746 64
Improved pavements charged to United Railways and Electric Company		1,139 33
Total for improved pavements, 1902	$137,375 62	
Maintenance of bridges and culverts, Levy Ordinance		25,000 00
Repairs of and painting bridges (special)		2,221 72
Maintenance of bridges and culverts from P. W. & B. R. R.		399 13
" " " " " " Contingent Fund		275 00
" " Light street drawbridge		6,815 30
" " Block street drawbridge		1,350 00
Total for bridges, 1902	$36,061 15	
Cross streets (beside for improved pavements)		1,969 60
Roads, streets, etc. (beside for improved pavements)		311 46
City property (beside for improved pavements)		409 54
Extra grading on Maryland avenue		528 98
Grading on Calvert street		1,375 87
Grading on Twenty-ninth street		268 76
Private paving and inspection		1,180 82
Paving certificates and interest		7,154 66
Salaries		7,319 92
Maintenance of property yard		127 54
Incidentals		71 67
		$194,155 59

The amount available for improved pavements in 1903 is as follows:

From assessments already collected	$ 23,127 04
" unexpended balances on streets not completed in 1902	68,545 41
" " " of Cross Streets and City Property Paving Funds of 1902	2,585 43
Balance due on assessment streets now in hands of Tax Collector	2,519 79
Approximate amount to be spent out of Cross Streets and City Property Paving Funds for 1903	5,000 00
Making in all	$101,777 67

Besides the above, which is now assured, there are other assessment streets which are likely to be collected and the work done in 1903.

GRADE ESTABLISHMENTS.

The amount of work on establishing grades under Ordinance No. 83, approved December 8, 1900, has been considerable during the year. The total length of streets on which the grades of both curb lines have been established during the year is 149,242 feet or 28.3 miles. The following table gives a list of the streets on which grades were established during the year:

Street.	From	To
Augusta ave	Frederick ave	Old Frederick road.
Alley E. of Rose	Jefferson	Orleans.
Aiken	North ave	Lanvale.
Alley E. of Jenkins lane	N. of Twentieth st	
Arch	Raborg	Saratoga.
Abel	Thirty-first	Merryman's lane.
Baltimore	Luzerne	Patapsco.
Broadway	Monument	Baltimore.
Belt	Alley N. of Randall	Meyers.
Barclay (re-established)	Thirty-first	Merryman's lane.
Baltimore	Smallwood	Garrison lane.
Bonner road	Liberty road	Winfield ave.
Baxter	Fairmount	Fayette.
Cromwell	Twenty-second	Kennedy lane.
Connecticut ave	Augusta ave	W. city limits.
Church lane	Saratoga	Dark lane.

Street.	From	To
Cathedral	Biddle	Mt. Royal ave.
Clifford	Amity	Scott.
Concord	Pratt	Water.
Courtland	Mulberry	Lexington.
Canton st	Biddle	Preston.
Carey	Baltimore	Ramsay.
Calhoun	Lafayette ave	Riggs ave.
Clarkson	Winder	Jephson.
Creek alley	McComas	Jephson.
Duncan alley	Ashland ave	Monument.
Dark lane	Church lane	St. Paul st.
Duncan alley	Baltimore st	Fairmount ave.
Dallas	Lombard	McElderry.
Dalrymple	Liberty road	Winfield ave.
Donaldson	Marshall ave	Sharp.
Elizabeth lane	Wells	150 southward.
Edgar Place	Baltimore	McElderry.
Eighth	North ave	Northwest.
Eager	Collington ave	Patterson Park ave.
Fairmount ave	Patterson Park ave	Patapsco.
Fayette	Carrollton ave	Fremont ave.
Grove	Baltimore	Fairmount ave.
Garrison	Oakford ave	Northern city limits.
Garrison lane	Baltimore	Edmondson ave.
Hoffman	Broadway	Hopkins ave.
Howard	Baltimore	Monument.
Hudson alley	Twentieth	Twenty-fifth.
Hoffman	Lakewood ave	Canton st.
Hooper ave	Woodberry ave	Plymouth ave.
Jephson	Hanover	Leadenhall.
Jefferson	Taylor	Tyler.
Jenkins alley	Hoffman st	Camel alley.
Jefferson ave	Milton ave	Lakewood ave.
Kenwood ave	Biddle st	Federal.
Cossuth	Old Frederick road	Dorsey's lane.
Latrobe	Reservoir	Park ave.
Luzerne	Boston	Hudson.
Lorraine	Old York road	Barclay.
Ludlow	Fort ave	Southward.
Luzerne	Biddle	Federal.
Lakewood	Biddle	Federal.
Lovegrove alley	Hamilton	Centre.

Street.	From	To
Leadenhall	Donaldson	Jephson.
Montgomery	Western city limits	600 feet eastward.
Morley	Old Frederick road	Dorsey's lane.
Mulberry	Gilmor	Arlington ave.
Montford ave	Canton ave	Boston.
McComas	Hanover	Creek alley.
McCulloh	Mosher	North ave.
Northwest	Fulton ave	Payson.
North ave	Payson	Slingluff ave.
Ninth	Baker	Northwest.
O'Donnell	Boston	Patuxent.
Old Frederick road	New Frederick road	W. city limits.
Old York road	York road	Northern city limits.
Oliver	Luzerne	Canton.
Oak	North ave	Twenty-fifth.
Pennsylvania	Fulton ave	Lynnhurst ave.
Pennsylvania	Orem ave	Northern city limits.
Port	Chase	Biddle.
Patuxent (re-established)	Baltimore	Eastern ave.
Paca	Franklin	Pratt.
Patuxent	Biddle	Federal.
Potomac	Biddle	Federal.
Park Heights ave	Pennsylvania ave	Shirley's lane.
Patapsco	Fort ave	Wells.
Rose	Orleans	McElderry.
Rose	Fayette	Baltimore.
Robinson	Dillon	Boston.
Race	Winder	Jephson.
Ramsay	Monroe	Millington.
Remmington	Twenty-eighth	Thirtieth.
Race	Fort ave	Randall.
Rogers ave.	Necessity alley	Front.
Raborg	Fremont	Greene.
Roland	Second	Third.
Sycamore	Third	Union.
Smallwood	Frederick ave	Eagle.
Sharp	Pratt	Barre.
Spring	Canton ave	Eastern ave.
Seventh	North ave	Northwest.
Twenty-eighth	Huntingdon	Remmington.
Twenty-ninth	Huntingdon	Remmington.
Thirtieth	Huntingdon	Remmington.

Street.	From	To
Twentieth	Kennedy	Aisquith.
Twenty-ninth	Oak	Remmington.
Westley	Old Frederick road	Dorsey's lane.
Winder	Hanover	Water front.
York road	Twenty-fourth	Northern city limits.

CEMENT TESTS.

Cement tests have been made from time to time by one of the assistants in my office. Tests have been made of 23 different brands and 790 briquetts have been broken. The importance of these tests increases each year. All other cities of the size of Baltimore have one or more assistants who devote their entire time to getting samples and making the tests. The room in the basement in which our tests are made is not well adapted for the purpose, and a better place should be provided. The requirements for tensile strength per square inch of section is shown below. For one day tests the sample is in air for one hour (or until set) and the balance of the time in water. For all other tests the sample is in air for 24 hours and in water the balance of the time. Crushed quartz is used for sand tests.

Natural Cement—	One Day.	Seven Days.	Twenty-eight Days.
Neat	75 lbs.	150 lbs.	225 lbs.
1 cement, 2 sand	.....	80 "	140 "
Portland Cement—			
Neat	125 lbs.	400 "	500 "
1 cement, 3 sand	.....	125 "	200 "

SUMMARY OF CEMENT TESTS.

Name of Brand.	Proportions.	Age, Days.	Tensile Strength.	No. Bricks.	Max.	Min.
Cumberland Rosendale.	Neat	1	104	35	151	62
" "	"	7	187	30	230	138
" "	"	28	341	5	391	91
" "	1—2	7	67	30	114	30
" "	1—3	7	32	10	42	27
" "	1—2	28	113	5	138	96
" "	1—2	60	172	5	198	156
" "	1—3	28	73	5	87	55
" "	1—3	60	94	5	101	79
" "	1—1	7	99	5	113	91
" "	1—1	14	208	5	244	180
" "	1—1	28	249	5	273	240
" "	Neat	60	379	5	430	362
Atlas Portland.....	"	1	474	15	542	414
" "	"	4	357	5	409	336
" "	"	7	647	25	839	597
" "	1—2	7	217	20	300	167
" "	1—4	7	88	3	92	85
Patapsco Slag.....	Neat	1	93	120	198	13
" "	"	7	357	75	520	190
" "	1—2	7	115	75	239	48
Paragon Portland.....	Neat	7	401	10	...	...
" "	"	1	245	10	328	177
Peerless Rosendale.....	"	1	118	10	152	103
" "	"	7	190	10	221	162
" "	"	20	237	5	275	191
" "	1—2	7	40	10	46	35
" "	1—2	14	52	5	54	48
F. O. Norton, Rosendale	Neat	7	82	10	120	48
" "	1—2	7	33	10	38	24
Alpha Portland.....	Neat	1	271	5	280	258
" "	"	2	294	5	318	267
" "	1—3	2	67	1	67	67
" "	Neat	7	736	5	886	533
Dragon "	"	1	219	10	268	163
" "	"	7	444	5	460	424
" "	"	28	672	5	781	566
Round Top Rosendale..	"	1	60	10	69	49
Vulcanite Portland	"	1	327	10	457	215
" "	"	7	754	10	880	620
" "	1—2	7	247	5	284	218

Name of Brand.	Proportions.	Age, Days.	Tensile Strength.	No. Bricks.	Max.	Min.
Lehigh Portland.....	Neat	1	386	10	456	345
" "	1—2	7	271	5	332	232
Krause "	Neat	1	332	5	362	268
" "	"	7	669	5	748	580
Toltec Slag.....	"	1	123	5	150	106
" "	"	7	409	5	443	350
Nazareth Portland.....	"	1	186	5	221	156
" "	"	7	474	5	540	372
" "	"	30	704	5	780	630
" "	1—2	30	289	5	351	277
Germania "	Neat	1	194	5	212	187
" "	"	7	305	5	344	242
Ulster Rosendale.....	"	1	96	5	105	88
Diamond Portland.....	"	1	335	5	407	274
" "	"	7	525	5	576	493
" "	"	28	710	5	786	588
Improved Union Rosendale.....	"	1	142	5	150	127
Improved Union Rosendale.....	"	7	189	5	211	160
Improved Union Rosendale	1—2	7	96	5	108	87
Silica.....	Neat	1	49	10	91	16
"	"	7	232	5	241	221
Union Rosendale	"	1	89	5	93	88
" "	1—2	10	77	5	80	67
Potomac "	Neat	7	129	5	147	120
" "	1—2	7	61	5	75	53
Shields' Hydraulic.....	Neat	1	116	5	134	98
" "	"	7	174	5	191	135
" "	1—2	7	87	5	105	78

ESTIMATES FOR STREET PAVING.

A considerable amount of this kind of work is done each year. Much of it would not be asked for if it was understood that a large amount of work is involved to no purpose. During the past year estimates amounting to $1,365,022 have been made for paving 236 blocks on 46 different streets.

Many of these require surveys and the examination of records.

FOOTWAY NOTICES.

The usual footway reports have been received from the Police Department and notices sent out. An important ordinance, No. 31, approved May 2, 1902, was passed, which requires the property owner in the Annex to construct footways on unpaved streets. This increased the amount of notices by about 1,000. The total number of notices sent out is 4,325. Of these 90 were requested by owners of the property. Most of the notices receive prompt attention, some owners neglect to comply till a second notice is sent, and a few fail to comply altogether, in which case the work is done by the city and an assessment sent to the Tax Collector. The amount of these is reported under "Roads, Streets, etc.," to which fund the work is charged in advance of the collection.

OFFICE WORK.

60 estimates for street paving.
17 sets of specifications prepared.
208 profiles made.
14 assessment sheets.
20 street plats.
5 reports on damage suits.
100 reports on various matters.
350 letters written.
494 orders for material.
590 bills in triplicate passed.
Numerous tracings and plans prepared.

I wish to acknowledge the faithful and efficient work which the assistants in my department have rendered the city.

Respectfully submitted.

O. W. CONNET,

Assistant City Engineer.

REPORT OF

NEWTON M. GRAY, Asst. City Engineer,

1902.

City Engineer's Office.

Baltimore, December 31, 1902.

Mr. B. T. Fendall,

City Engineer:

Sir:—I beg to submit the following report, showing the operations of the Sewer Division of your department during the year ending December 31, 1902:

NEW SEWERS.

OGIER RUN SEWER, HARE STREET AND PATUXENT STREET LATERALS.

Ordinance of Estimates for the Year 1902.

The first work performed under this appropriation was the construction at the interseetion of Patuxent street and Baltimore street of four inlets emptying into brick chambers provided with manholes, the whole connected with a 24-inch terra-cotta outlet pipe. The 24-inch pipe was continued for about 325 feet south of Baltimore street, thus nearly completing the Patuxent street lateral. The itemized cost is as follows:

Foreman and bricklayer	$156 00
Stonecutter	26 00
Laborers	380 40
Terra-cotta pipe, 24-inches and 15-inches diameter	446 43
Cement	45 29
Sand	16 53
Sewerflags	44 60
Cover-stones and dripstones	79 00
Bricks	63 93
	$1,258 18

Work on the construction of the Ogier Run sewer was begun at the intersection of Baltimore street and Hare street on June 9th, and continued eastward in Baltimore street to Canton street, northward in Canton street to Fairmount avenue, and eastward a short distance in Fairmount avenue, operations being continued until December 31st. This sewer is circular in form, and is built of concrete throughout, except that the lower semicircle is lined by a brick ring 4½ inches in thickness, which ring extends into the upper semicircle to the springing line of the arch on each side. The portion constructed consists of two sections, one section having a diameter of 9 feet 6 inches and a length of 264 feet, the other a diameter of 9 feet and a length of 365 5-10 feet. Beyond this the concrete invert of the 9-foot section was constructed for a distance of 67 feet. The excavation was principally through a stiff clay and varied in depth from 10 feet to 17 feet. The excavation of the trench at the intersection of Baltimore and Hare streets was attended with especial difficulty and expense, owing to the necessity for the removal of the old stone culvert which existed at that point, and also a large quantity of mud and stones which had collected within the culvert above the grade line of the new sewer.

A great deal of water was encountered in the bottom of the excavation, making constant pumping necessary. This was accomplished by means of a vacuum pump attached to the city water supply, through the action of which the water was lifted over the side of the cut and discharged into the adjoining marsh. Since the grade line of the sewer is below the level of the stream at its outlet, it was also necessary to construct a dam to prevent the backing-in of the water, and to lift the water flowing down the sewer over this obstruction by means of another vacuum pump. Every heavy rain naturally caused delay by filling the sewer with water faster than the pumps could remove it. The concrete construction was begun July 23rd, the concrete being mixed by hand for

OGIER'S RUN SEWER.

a period of six weeks, until September 3rd, when the Ransome revolving concrete-mixer, whose delivery had been much delayed, was put in operation. The construction of the concrete arches was postponed from day to day in expectation of the arrival of the mixer, which made it necessary to spread out the excavated material over the adjoining ground instead of filling it back immediately on the completed arch. It was afterwards necessary to re-excavate much of this material for filling, which greatly increased the cost of the excavation. Besides many lesser rains, very violent storms with exceedingly heavy rain-fall occurred on September 25th, 26th and 29th; October 5th, November 25th and December 3rd. Some of these storms caused the timbering to give way and washed the sides of the cut into the bottom, and all completely filled the sewer with water, causing considerable delay and expense before the work could be resumed. The additional work made necessary by these causes, as well as all the timbering required, is included with the excavation, which will account for the high cost of this item. The work was very much delayed during October and November by failure of the contracting companies to furnish the requisite amount of sand and stone. Five inlets with their necessary pipe connections were constructed—four at the intersection of Baltimore and Hare streets, and one at the intersection of Baltimore and Canton streets.

The original design for the Ogier Run Sewer embraced the location of a portion of the sewer in the bed of Canton street, from Baltimore street to Lombard street. Subsequently it was decided to construct the sewer in the bed of Baltimore street, from Canton street to Hare street, and thence in the bed of Hare street to Lombard street. Owing to this change of location the "Hare street lateral" will not be required.

Statement Showing Cost of Work.

Excavation and refilling 7,128 cu. yds. at $1.40	$9,979 20
Concrete (stone, cement, sand, labor) 2,214 cu. yds. at $4.19	9,276 66
Invert (bricks, cement, sand, labor) 1,153 sq. yds. at $2.00	2,306 00
Masonry-wall at outlet, 30 cu. yds. at $5.40	162 00
Inlets—inlet-connections and manholes	730 72
Centers, profiles, etc	442 05
Hardware tools, etc	269 26
Cost of concrete mixer and engine	756 00
Lumber	798 80
Hauling	60 83
Incidentals	381 69
Cement-shed	168 82
Water Department (removal of pipes, etc.)	122 98
Foreman	1,234 00
Watchman	440 00
Inspector	381 75
	$27,510 76

Total Expenditure.

Ogier's Run sewer	$27,510 76
Patuxent street lateral	1,258 18
Material on hand	833 62
	$29,602 56

Charges—	
Ogier's Run sewer, Hare street and Patuxent street laterals.	$28,500 00
Improvements in and additions to drainage system, appropriation of 1902	180 53
Improvements in and additions to drainage system, appropriation of 1903	922 03
	$29,602 56

EXTENSION OF JENKINS' RUN SEWER.

Ordinance No. 125, Approved May 2, 1901.

The new sewer provided for by the above-named ordinance, and constructed in accordance therewith, begins at the former terminus of the Jenkins' Run sewer, 48 feet north of Twentieth street, near Oak Hill avenue, and extends in a northerly direction, in the bed of Jenkins' Run, a

distance of 130 feet, and thence in a northeasterly direction, in the bed of said run, an additional distance of 615 feet. The total length of sewer constructed is 745 feet. This sewer lies in the bed of an alley, which was deeded to the city by the heirs of the Kennedy estate. The new sewer is circular in form, 9 feet 6 inches in diameter, and is built entirely of concrete, with the exception of the invert, which is lined with vitrified bricks in the lower portion, and with hard, red bricks in the upper portions, to the height of the springing lines of the arch. Experiments, extending over a period of two or three weeks, were made with the view of reducing the cost of the concrete to the lowest possible figure consistent with safe construction. Several mixtures, in which the proportions of cement, sand and stone varied considerably, were made and tested, and after careful consideration of the results of these tests, it was decided to use in all parts of the work concrete composed of one (1) part of cement, three (3) parts of sand, and seven (7) parts of 2-inch crushed stone. In mixing concrete for the arch, a small quantity of fine stone was added for the purpose of securing a smooth surface on the inside of the arch. The concrete proportioned as above has proven to be satisfactory in every respect. American Portland cement was used in all parts of this work.

The cost of excavation, refilling, and covering arch, as given below, appears to be excessively high, and requires some explanation. For the protection of the work during its construction, it was necessary to divert the stream by the construction of a dam a short distance above the point at which the new sewer ends, and to dig a ditch, parallel to the stream, from the dam to a point near the end of the old sewer. In making the excavation for the sewer the men were required to work in mud and water, and the material taken out had, first, to be lifted and deposited upon the bank, five or six feet above the level of the stream, and then moved back to make room for the wheelbarrow runs and for

materials. During the progress of the work nine heavy downpours of rain occurred, and on each of these occasions the dam was broken by the force of the water, and large quantities of silt deposited in the sewer trench and drainage ditch. Whenever this occurred it became necessary to re-excavate portions of the sewer trench and ditch. Finally, in covering the arch all of the excavated material had to be moved and placed in position. As shown above, the excavated material was handled at least three times before the completion of the work. The concrete used in the construction of the Jenkins' Run sewer (with the exception of a small quantity made by hand in beginning the work), was mixed and prepared for use by the "Hains" gravity concrete mixer. This machine, which consists of a series of hoppers, placed one above another, mixes the materials employed in making concrete very thoroughly and rapidly, and the results obtained by its use, when compared with the older method of mixing by hand, demonstrate fully the superiority of mechanical appliances for making concrete. The work was commenced on May 14, and completed on December 18, 1902.

Statement Showing Cost of Work.

Excavation, refilling and covering arch, 2,220 cu. yds. at $1.49.	$3,307 80
Concrete (stone, cement, sand and labor) 2,461 cu. yds. at 3.96.	9,745 56
Invert (bricks, cement, sand and labor) 1,402 sq. yds. at 2.14.	3,000 28
Centers, profiles, etc	354 77
Inlet connections and manholes	85 00
Hardware, tools, etc	199 58
Rental of concrete machine	260 48
Framing machine, lumber, labor, etc	60 92
Superintendence and inspection	1,316 00
Excavation and re-excavation of ditch; construction and reconstruction of dam; construction of cement shed; moving and setting up machine; making runways; cleaning up, hauling and other incidentals	1,665 09
	$19,995 48
Appropriation	$20,000 00
Amount expended	19,995 48
Balance	$4 52

SEWER IN FIRST AND REMINGTON AVENUES.

Ordinance of Estimates for the Year 1902.

This sewer begins at the intersection of First and Chestnut avenues, and extends in First avenue to Remington avenue; thence in Remington avenue to a point near the bridge crossing the Maryland and Pennsylvania railroad, a distance of 980 feet. From this point it extends in a southwesterly direction, through a right-of-way over private property for a distance of 120 feet, and empties into Stony Run. From Chestnut avenue to Cedar avenue the sewer consists of an 18-inch terra-cotta pipe; from Cedar avenue to the end of the sewer it consists of a 24-inch terra-cotta pipe, except down the slope from Remington avenue to the Maryland and Pennsylvania railroad, where a 24-inch cast-iron pipe was used on account of the heavy grade. Cast-iron pipe was also laid under the railroad tracks, to prevent any fracture or displacement by the trains passing over the road. Inlets and manholes were constructed at each street intersection along the line. The total length of this sewer is 1,100 feet. Work was commenced on April 27 and completed on October 16, 1902.

The large balance shown below is due to changes in the grades of the sewer pipes. These grades were determined originally, and the estimate of cost made upon the assumption that the water and gas pipes would be found at the usual depth, about three feet below the surface of the street. Subsequently it was discovered that the water and gas pipes were laid at a depth much greater than had at first been supposed, and for this reason it became necessary to change the grades at several points, in order that the sewer might pass under the water and gas pipes. These changes resulted in steeper grades, and consequently in a reduction in the diameter of a portion of the sewer, with a corresponding reduction in the cost of the work as originally estimated.

Statement Showing Cost of Work.

Excavation, including timbering and refilling, 1,158 cu. yds. at $1.12	$1,296 96
Laying pipes (cement, sand, gravel and labor) 1,081 lin. ft. at $0.29	313 49
Inlets, man-holes and chambers (material and labor)	1,051 71
18-inch D. S. terra-cotta pipe, 342 lin. ft. at $0.6035	206 40
24 " " " " 706½ " " $1,153	814 59
24 " cast iron pipe (straight)21,242 lbs. at $29.10 per 2,000 lbs.	309 07
24 " " " (bends) 2,784 lbs. at $3.68 per 100 lbs	102 45
Hauling cast-iron pipe	8 40
Hardware, tools, etc	93 35
Re-constructing roadway and repaving around inlet	780 63
Incidentals, pumping, building office, dams, etc	217 97
Foreman	324 00
Watchman	54 00
Total cost of work	$5,573 02
Appropriation	$6,600 00
Amount expended	5,573 02
Balance	$1,026 98

CEDAR AVENUE LATERAL SEWER.

Ordinance of Estimates for the Year 1902.

This sewer, consisting of a 20-inch terra-cotta pipe, extends in Cedar avenue from a point about 210 feet north of Second avenue to First avenue, a total distance of 842 feet. This sewer connects with the First and Remington avenues sewer, described in this report. Two inlets were constructed at the intersection of Cedar and Second avenues, and one at the west side of Cedar avenue near the beginning of the sewer.

In digging the ditch good gravel was encountered, which was used for packing around the terra-cotta pipes. This not only decreased the cost of laying the pipes, but also decreased the cost of excavation and refilling, as there was not so much surplus material to haul to the dump. Work was commenced on June 21 and completed on October 4, 1902.

Statement Showing Cost of Work.

Excavation, including timbering and refilling, 764 cubic yards at $0.53	$404 92
Laying pipes (cement, sand and labor), 835 lineal feet at $0.19	158 65
Inlets, man-holes and chambers (material and labor)	539 31
Twenty-inch D. S. terra-cotta pipe, 834 lineal feet at $0.7988	666 20
Hardware, tools, etc	3 84
Reconstruction of roadway and repaving around inlets	74 21
Foreman	140 00
	$1,987 13
Appropriation	$2,250 00
Amount expended	1,987 13
Balance	$262 87

DRUID HILL AVENUE SEWER.

Ordinance of Estimates for the Year 1902.

This sewer begins at the intersection of Whitelock street and the 10-foot alley west of Druid Hill avenue and extends in Whitelock street to Druid Hill Avenue; thence in Druid Hill Avenue to Clendenin street, and connects with the old stone sewer at that point. This sewer consists of terra-cotta pipe throughout, with a diameter of 30 inches in Whitelock street and a diameter of 24 inches in Druid Hill avenue. The total length of sewer is 469 feet. Two inlets were constructed at the intersection of the 10-foot alley and Whitelock street. In excavating for the section in Druid Hill avenue, an old cement pipe, 15 inches in diameter, was encountered. Finding this pipe to be very much decayed, and right in the line of the new sewer, it was decided to tear it out as far as Whitelock street. All houses, found to be connected with this pipe, were connected with the new sewer. Work was commenced on April 7 and completed on May 27, 1902.

Statement Showing Cost of Work.

24-inch	D. S. T. C.	pipe	410	lin. ft.	at	$1.153	$472 73
30 "	"	"	62½	"	"	2.4475	152 97
20 "	"	"	10	"	"	0.7988	7 99
15 "	S. S.	"	24	"	"	0.354	8 50
6 "	"	"	12	"	"	0.15	1 80
Hand-made bricks			8,500		"	7.25	61 63
Cement							42 87
Screened sand, 16 cu. yds. at $0.75							12 00
Unscreened " 6 " " 0.55							3 30
Inlet covering stone, one set No. 1							26 84
" " " " " " 2							19 00
" " " 12.67 sq. ft. at $0.70							8 87
Hardware, tools, etc							34 80
No. 2 crushed stone, 1.95 cu. yds. at $1.55							3 02
Water Department, moving pipes							15 01
Lumber							33 72
Hauling							2 00
Inlet covering flags, 128.15 sq. ft. at $0.50							64 08
One 30-inch inlet door							12 50
Labor and superintendence							1,085 22
Repaving over trenches							284 26
Total cost of work							$2,353 11
Appropriation							$2,400 00
Amount expended							2,353 11
Balance							$46 89

Clement Street Sewer.

Ordinance of Estimates for the Year 1902.

This sewer is a lateral to the Beason street sewer, entering the latter at the intersection of Beason street and Stewart street, and running thence westward in Beason street for about 155 feet; thence southward on the property of the B. & O. R. R. Co. 425 feet to Clement street; thence westward in Clement street about 315 feet to the intersection of Clement street and Andre street. The sewer consists of a 30-inch terra-cotta pipe, running from the outlet at Beason street a distance of about 690 feet to

the south side of Garrett avenue; and a 20-inch terra-cotta pipe running from the last named point for about 200 feet to the intersection of Clement street and Andre street; the curves at points where change of direction occurs being built of brick. Three inlets were constructed; one at the southwest corner of Clement street and the 5-foot alley east of Garrett avenue and two at the northwest and southwest corners respectively of Clement street and Andre street; the two latter emptying into a brick connecting chamber provided with a man-hole. The work was begun September 15th, and except that the inlets were not entirely finished, was completed December 13th. The cost of the work described above exceeds the appropriation, as shown in the statement given below. This difference is the result of a change in the location of a portion of the sewer and an advance in the price of sewer pipes. In estimating the cost of this work it was assumed that the sewer would be constructed (as originally designed) in the bed of Clement street, from Andre street to Stewart street and thence in the bed of Stewart street, on the property of the B. & O. R. R. Co. to Beason street. Failure to obtain a right of way from the B. & O. R. R. Co. for the construction of the sewer in Stewart street, made it necessary to change the location to a line parallel to Stewart street and about midway between Stewart street and Garrett avenue. This line lies on the property of B. & O. R. R. Co. and the right to construct the sewer thereon was granted by said company. The change of location described above involved a large increase in the quantity of excavation, and also a considerable increase in the quantity of brickwork and repaving over and above the quantities upon which the estimate of cost was based; and the prices paid for the sewer pipe used in the work, under the contract for 1902, were from ten to thirty per cent. greater than the prices for similar material in 1901, which were used in estimating the cost of the pipes.

Statement Showing Cost of Work.

Excavation and refilling, 700 cubic yards at 87c	$ 609 00
Terra-cotta pipe, 30 inches, 20 inches, and 15 inches diameter	1,684 61
Laying pipe	218 40
Inlets, brick curves and chambers and manholes	710 60
Lumber and incidentals	119 25
Foreman	209 00
Watchman	98 00
Repaving	163 15
	$3,812 01
Appropriation	3,600 00
Amount expended in excess of appropriation	$212 01
Charged as follows:	
To repairs of sewers, appropriation of 1902	$163 15
To improvements in and addition to drainage system, appropriation 1902	48 86
	$212 01

GARRETT AVENUE LATERAL SEWER.

Ordinance of Estimates for the Year 1902.

This lateral sewer consists of a 15-inch terra-cotta pipe connecting with the Beason street sewer at the intersection of Beason street and Garrett avenue, and running thence southward in Garrett avenue about 290 feet to a connection with an inlet already constructed at that point. The pipe connecting this inlet with the already existing 15-inch pipe in Garrett avenue, which was overcharged by heavy rainfalls, was taken up and connection was made with the new pipe. The connection with the Beason street sewer was made by a chamber built of brick, and a manhole was also constructed of brick near the inlet. The work was begun November 1st and completed December 13th, 1902.

Statement Showing Cost of Work.

Excavation and refilling 260 cu. yds. at $1.02	$265 20
Terra cotta pipe, 15 inches diameter	116 95
Laying pipe	61 60

Inlet, brick chamber and manhole	$100 00
Lumber and incidentals	6 25
Foreman	50 00
	$600 00
Appropriation	$600 00

SEWER IN TWENTY-FIRST STREET.

This sewer consists of a double line of 15-inch terra-cotta pipe 140 feet in length, running from Oak street in Twenty-first street westward to the 15-foot alley between Oak street and Jefferson Place. An inlet was constructed on the south side of Twenty-first street, to receive the water flowing from said alley, and a brick chamber was built under the sidewalk at Oak street to conduct the water into the gutter; said chamber being covered with castiron plates the tops of which are at the level of the sidewalk. This work was begun June 3rd and completed June 21st, 1902.

Statement Showing Cost of Work.

Terra-cotta pipe	$ 96 29
Cement	15 30
Bricks	18 12
Sand	6 70
Five-inch curb	10 40
Cast-iron plate	14 52
Incidentals	11 66
Labor	134 08
	$307 07

Charged to Improvements in and Additions to Drainage System, appropriation of 1902.

SEWER IN TWENTY-NINTH STREET AND HUDSON ALLEY.

This sewer is designed to carry Twenty-ninth street over Sumwalt Run at a point 150 feet west of Maryland avenue. The diameter of this sewer is 8 feet 6 inches, and the construction is in every respect similar to that of the Jenkins

Run sewer described in this report. The work was commenced on December 8, 1902, and is now being prosecuted as rapidly as the weather will permit. Satisfactory progress has been made to date.

Amount expended to December 31, 1902.....$813 58

Charged to Improvements in and Additions to Drainage System, Appropriation of 1902.

SEWER IN PARK HEIGHTS AVENUE AND GORDON'S LANE.

This sewer, consisting of a 24-inch terra-cotta pipe, begins on the east side of Park Heights avenue, about 160 feet north of Gordon's Lane, and extends across said avenue to the west sidewalk, thence in a southerly direction to Gordon's Lane; thence in Gordon's Lane to the east side of the Reisterstown Road, emptying into an open ditch at that point. The old inlet on the west side of Park Heights avenue, north of Gordon's Lane, was reconstructed and connected with the new sewer. The total length of this sewer is 654 feet. Work was commenced on September 1, and completed on Nov. 8, 1902.

Statement Showing Cost of Work.

24-inch D. S. terra-cotta pipe..	676 lin. ft. at $1.153.....		$779 43
Hand-made bricks.....	6,500 at 7.45		49 72
Cement.....	80 bags at 0.42		33 60
Screened sand.....	14 cu. yds. at 0.75		10 50
Unscreened sand.....	42 " " at 0.55		23 10
Inlet covering stone.....	17.87 sq. ft. at 0.70		12 51
Tools, etc.....			.70
Covering flags for outlet and inlets.....			102 20
Crushed stone, 11 cu. yds. at $2.50.....			27 50
Hauling.....			8 00
Amount paid for right-of-way for sewer.....			130 00
Recording deed for same.....			3 25
Labor and superintendence.....			778 97
Total cost of work.....			$1,959 48

Charged to Improvements in and Additions to Drainage System, appropriation of 1902.

SEWER AT FULTON AVENUE AND BAKER STREET.

This sewer, consisting of a 30-inch terra-cotta pipe, was laid for the purpose of relieving the low, basin-shaped area at the intersection of Fulton avenue and Baker street, which, prior to the construction of the sewer, had been subject to overflow whenever a heavy downpour of rain occurred. The sewer extends from the north to the south side of Fulton avenue, at the intersection of said avenue with Baker street, and connects with the sewer 8 feet 9 inches in diameter in Baker street, a short distance west of Fulton avenue. Two inlets in Baker street, east of Fulton avenue, were reconstructed and connected with this sewer.

Statement Showing Cost of Work.

30-inch terra-cotta pipe, 160 lin. ft. at $2.4475	$391 60
10-inch terra-cotta pipe, 10 lin. ft. at $0.225	2 25
Labor, superintendence and incidentals	791 78
Relaying asphalt pavement	81 31
	$1,266 94

Charges.

Improvements in and additions to drainage system, appropriation of 1902	$1,148 35
Repairs of sewers, appropriation of 1902	118 59
	$1,266 94

PIPE IN CARROLL AVENUE.

A terra-cotta pipe 15 inches in diameter was laid in Carroll avenue, beginning at a point about 900 feet east of the Old York road, and extending to Jenkins Run, a distance of 176 feet. This pipe was laid to protect the roadbed and adjacent property from overflow.

Cost of the above:

15-inch terra-cotta pipe, 176 lin. ft. at $0.354	$62 30
Labor, superintendence and incidentals	106 47
	$168 77

Charged to Improvements in and Additions to Drainage System, appropriation of 1902.

PATTERSON PARK AVENUE AND GAY STREET SEWER.

This sewer is a lateral consisting of a 24-inch terra-cotta pipe, connecting with the old stone sewer in North avenue at the intersection of Patterson Park avenue and North avenue, and running thence southward in Patterson Park avenue a distance of about 570 feet to Gay street; thence southwestward in Gay street for about 190 feet to a connection with the two inlets already existing at that point. The connection was made by a brick chamber provided with a manhole, and a brick curve, the inlet on the northwest side of Gay street being torn down and rebuilt and considerably enlarged. A manhole about 13 feet in depth was constructed at the intersection of Patterson Park avenue and Gay street. The excavation varied in depth from 6 feet to 13 feet, the greater part having a depth of about 12 feet. The work was begun May 26th and completed August 23rd, 1902.

Statement Showing Cost of Work.

Excavation and refilling, 1,500 cu. yds. at 80c	$1,200 00
Terra-cotta pipe, 24 inches in diameter	899 34
Laying pipe	150 00
Inlet, brick chamber curve and manholes	320 00
Lumber, hardware and incidentals	70 71
Foreman	312 00
Watchman	18 00
Repaving	615 08
	$3,585 13

Charged to Improvements in and Additions to Drainage System, appropriation of 1902.

RECONSTRUCTION AND REPAIR.

RECONSTRUCTION OF CENTRAL AVENUE SEWER.

The reconstruction of Central avenue sewer, which was suspended at a point about 20 feet south of Pratt street on November 23, 1901, was resumed April 3, 1902, and continued for a distance of 310 feet, to the intersection of Central avenue and Granby street. This section is similar in every respect to the sections constructed in 1900 and 1901, of which a full description will be found in the Report of the City Engineer for the year 1900. In the reconstruction of the last year it was necessary to carry the work under the tracks of the United Railways Company at the intersection of Pratt street and Central avenue. Considerable delay was experienced in this part of the work, as the traffic had to be maintained during construction, first over one track and then over the other. The difficulties encountered have caused the price of excavation to be higher than that of the previous year.

Statement Showing Cost of Work.

Excavation and refilling 1,550 cu. yds. at $1.29	$1,999 50
Brickwork 443 cu. yds. at $7.50	3,322 50
Masonry backing (labor, sand, cement) 410 cu. yds. at $3.00	1,230 00
Vitrified brick invert 567 sq. yds. at $1.60	907 20
Concrete, 130 cu. yds. at $6.00	780 00
Lumber, hardware, incidentals	226 73
Foreman	468 00
Watchman	346 00
Repaving	250 00
	$9,529 93

Charged to repairs of sewers, appropriation of 1902.

RECONSTRUCTION OF HAMMOND ALLEY SEWER.

The old stone sewer in Hammond alley, between Albemarle street and Central avenue, which had been in exist-

ence for many years, and had become a source of constant expense for cleaning and repairing, and a menace to the city's interests, owing to its liability to become obstructed and to cause flooding of adjacent streets and private property, was removed and replaced by a terra-cotta pipe sewer. The new sewer connects with the large sewer in Central avenue, and extends in Hammond alley, with a diameter of 30 inches, to Exeter street; thence in said alley, with a diameter of 24 inches, to Albemarle street. Across Albemarle street the sewer consists of a 16-inch cast-iron pipe taken from stock on hand. Manholes were constructed at intervals of about 150 feet to facilitate the removal of obstructions. The lots binding on Hammond alley, between Albemarle street and Central avenue, are, in general, below the level of the alley. The drainage of these lots, which formerly went into the old sewer, was provided for by connections with the new sewer, made with 6-inch terra-cotta pipes. The work was commenced on August 1st and completed (with exception of inlets at Albemarle street and Exeter street) on December 31st, 1902. The inlets will be finished in January, 1903.

Statement Showing Cost of Work.

30-inch terra-cotta pipes, 341 lin. feet, at $2.4475	$ 834 60
24-inch terra-cotta pipes, 342 lin. feet, at $1.153	394 33
Bricks, 7 M., at $7.25	50 75
Cement, 16 bbls. at $1.53	24 48
Sand, 6 cu. yds., at $0.71	4 26
Cast-iron manhole covers, 3 sets, at $13.50	40 50
Inlet pipes	17 65
Lumber, tools, etc	386 07
Labor and superintendence	1,895 39
Repaving over sewer	205 25
	$3,853 28

Charged to Repairs of Sewers, appropriation of 1902.

JENKINS' RUN SEWER.

Repairs were made in the sewer located in Carter alley, between Lanvale street and Lafayette avenue, known as the "Jenkins' Run Sewer," as follows: a section of the old worn-out wooden floor, 295 feet in length and 8 feet in width, was removed and replaced by a pavement of granite blocks laid in cement.

Cost of the above:

Granite blocks	$244 64
Cement and sand	62 98
Labor, superintendence and incidentals	906 47
	$1,214 09

Charged to repairs of sewers, appropriation of 1902.

CENTER STREET SEWER.

The old worn-out wooden bottom of the sewer in Centre street, between North and Davis streets, and between Calvert and St. Paul streets, was cut out for a distance of 166 feet, to the width (8 feet) of the sewer, and replaced by granite blocks laid in cement, and the sidewalk, for a distance of 370 feet, were pointed and repaired.

Cost of the above:

Granite blocks	$165 45
Cement and sand	88 10
Labor, superintendence and incidentals	709 92
	$963 47

Charged to repairs of sewers, appropriation of 1902.

INLETS REPAIRED.

Greenwillow street and Shields alley	$18 03
Roland and Third avenues	17 04
Mullikin and Lewis streets	17 03
Gorsuch avenue and York road	16 71
Cedar avenue and Bay street	23 13
Franklin street and B. & P. R. R.	12 84
Homewood avenue and Eager street	33 19
Lombard and Exeter streets	21 94
Old York road and Gorsuch avenue	15 02
Front and Fayette streets	10 05
Laurens and Fremont streets	8 08
Caroline and Madison streets	24 19
Maryland avenue and Jones' Falls	8 91
Thames and Wolfe streets	14 58
City Yard, piling pipe	23 85
John and McMechen streets	6 88
Liberty and Lombard streets	21 14
Liberty street and Park avenue	18 09
Front and Centre streets	30 13
Central avenue sewer	99 54
Greenmount and North avenues	14 98
Saratoga and Holliday streets, 3 inlets	15 81
Monument and Buren streets	8 64
West and Cross streets	9 83
Monument street, near Eden street	21 68
Bond street, near Ashland avenue	14 86
Maryland avenue and Falls road	7 89
Orchard and Tessier streets	9 00
Lancaster street and Central avenue	10 04
Mullikin street and Central avenue	10 44
Calhoun street, near Lanvale street	13 18
Richland street and Pennsylvania avenue	13 63
Broadway and Barnes streets	16 72
Broadway and Lancaster street	7 38
Patterson Park avenue and Gay street	206 28
Central avenue and May street	12 53
Central avenue and Union street	10 32
Central avenue and High alley	9 43
Vine street, near Pine street	24 19
Central avenue and Mullikin street	7 63
Twenty-fifth street near Oak street	70 10
Charles street and Mt. Royal avenue	16 49

Federal and Chapel streets	$ 9 00
Chester street and Ashland avenue	9 36
Caroline and Federal streets	8 61
Lombard and Schroeder streets	8 00
Lexington street and Central avenue	26 23
Fairmount and Kenwood avenue	29 77
York road and Merryman's lane	41 91
Ann and Lombard streets, 2 inlets	76 46
Central avenue and Fayette street	7 22
Central avenue and Cochran alley	7 22
Broadway and Lombard street	7 47
Boston and Leakin streets	8 54
Maryland avenue and Eager street	7 67
Central avenue and Mullikin street	9 28
Cross street and Sterrett alley	9 08
Central avenue and Pratt street	9 63
Ann and Pratt streets	24 76
Boston and Patuxent streets	23 43
Bond and Abbott streets	59 23
City yard, repair storeroom	9 94
Maryland avenue and Jones' Falls	12 68
Pratt and Mill streets	10 19
Light and Camden streets	81 48
Bloom and Etting streets, 2 inlets	51 91
Hanover and Camden streets	14 41
Pratt and Hanover streets	8 05
Greenmount avenue, rear of 723	25 58
Lanvale and Washington streets	87 26
Townsend and Castle streets	33 87
Townsend and Chester streets, 4 inlets	141 31
Light and Camden streets	10 67
Edmondson avenue and Calhoun street	9 62
Central avenue and Orleans street	8 49
North avenue and Chester street	54 93
Lanvale and Wolfe streets, 2 inlets	45 44
Fulton avenue and Francis street	19 19
Stockholm and Carroll streets	23 35
Fremont avenue and Hamburg street, 2 inlets	34 80
Hillen street and Jones' Falls	79 00
Boston and Gwynn streets	14 63
Cross and Charles streets	10 00
Leadenhall and Stockholm streets	54 30
Warner and Hamburg streets	30 16

Race and Wirt streets	$23 16
Balderson and Light streets	13 04
Eager street and Greenmount avenue, 2 inlets	41 71
Front and Low streets	7 00
Greenmount avenue, rear of 727, McKim street sewer	19 34
Cross street sewer, east of Light street	10 09
Penn street and Cider alley	18 10
Cross street and Battery avenue	14 32
Camden street sewer, east of Howard street	10 92
Register and Gough streets	53 08
Guilford avenue and Chase street	17 99
Lafayette avenue and Broadway	19 37
Jefferson and Wolfe streets	18 22
Orleans and Wolfe streets	18 89
Broadway and Gough street	53 58
Gay and Wolfe streets	24 80
Pratt and Eden streets	61 84
Alluvion and Warner streets	28 20
Warner and Wayne streets	23 54
Greenmount avenue and Hoffman street	22 09
Edmondson avenue and Gilmor street, 2 inlets	35 64
Lewis and Mullikin streets	30 27
Central avenue and Mullikin streets	10 89
Penn and King streets	9 45
Penn and Pratt streets	12 54
Eager street and Homewood avenue, 3 inlets	40 22
Chase street and Guilford avenue, 3 inlets	71 47
Pratt street and Stable alley	31 00
Luzerne street and Foster avenue	17 90
Monroe and McHenry streets, 2 inlets	43 93
Landwehr lane and Hollins street	11 33
Monroe and Ramsay streets, 2 inlets	18 51
Lafayette avenue and Calhoun street	9 39
Monroe and Ramsay streets	15 28
Eagle street and Addison alley	37 89
Calhoun and McHenry streets, 2 inlets	34 51
Calhoun and Pratt streets	33 16
Twenty-fifth street, near York road	14 64
Front and Low streets, 2 inlets	12 35
North avenue and McMechen street	62 20
Lombard and Eden streets, 2 inlets	52 71
Eden and Pratt streets	29 33
Central and Fairmount avenues	55 75

Lombard and Ann streets	$34 33
Boston street, between Windsor and Leaken streets	67 89
Luzerne and Hudson streets	12 47
Ensor and Biddle streets	11 47
Calhoun and Saratoga streets, 2 inlets	23 69
Linden avenue and Preston street, 2 inlets	25 38
Lafayette avenue and Calhoun street, 2 inlets	64 04
Mosher and Calhoun streets	26 31
Montford avenue and Gay street	10 40
Lafayette avenue and Calhoun street	18 18
Schroeder and Raborg streets	45 11
Ridgely and Ostend streets	14 17
Howard and Camden streets	20 68
Franklin street and Woodyear alley	21 06
North avenue and Oak street	34 91
Pine and Vine streets	11 08
Leadenhall and Ostend streets	23 26
Caroline and Aliceanna streets	12 97
Broadway and Lancaster street	22 88
Lanvale and Calhoun streets	38 06
Lanvale and Stricker streets	10 12
Franklin and Calhoun streets	19 46
Edmondson avenue and Calhoun street	9 15
Franklin and Carey streets, 2 inlets	51 45
Sharp and Pratt streets	9 31
Barclay street, east of Thirty-first street	10 64
Front and Low streets	7 63
Carrollton avenue and Saratoga street, 2 inlets	57 33
Boston street, near Chester street	13 37
Myrtle avenue and Pierce street	9 75
Pine street and Penn alley	11 63
Vine street, near Pine street	47 12
Park avenue and Marion street	11 64
Fayette and Schroeder streets	13 91
Pratt street and Hollander alley	11 94
Pennsylvania avenue, near Sewell street	14 58
McMechen street and Jordan alley	108 77
McDonogh and Barnes streets	12 39
Montford avenue and Gay street	49 09
Wolfe and Chase streets	33 00
Hopkins avenue and Chase street, 2 inlets	33 61
Wolfe and Chase streets	32 77
Wolfe and Federal streets	11 65

Stockholm and Leadenhall streets	$10 45
Central avenue and Cochran alley	9 90
Central avenue and Aliceanna street, 2 inlets	52 29
Central avenue and Mullikin street	33 32
Central avenue and Fawn street	9 27
Pratt and Stricker streets	37 86
Fairmount avenue and Wolfe street	17 01
Abbott and Bond streets	12 62
Lexington street and Central avenue	15 55
Maryland avenue and Oliver street	13 70
Franklin and Calhoun streets	10 42
Lemmon street, near Carey street	23 61
Central avenue and High alley	15 01
Preston street and Jones' Falls, 4 inlets	46 95
Central avenue and Philpot street	9 91
Front and Low streets, 2 inlets	26 96
Light and Camden streets	15 53
Broadway and Townsend streets	11 92
Stockholm and Nanticoke streets	14 60
Maryland avenue and Oliver street, 2 inlets	78 35
Mt. Royal avenue and Charles street	15 25
Pratt street, east, in front of 410	11 44
Lewis and Mullikin streets	42 39
Central avenue and Mullikin street	13 69
Broadway and Lancaster street	14 51
Lombard street and Central avenue	11 58
Low and Exeter streets	25 63
Saratoga and Carey streets	9 33
Franklin and Carey streets	13 07
Low and Chestnut streets	15 51
Central avenue and Gough street	35 08
Portland and Penn streets	9 37
Madison street and Morton alley	71 26
Pratt and Frederick streets	18 39
Madison and Constitution streets	15 36
Ashland avenue and Dallas street	12 20
Central avenue and Cochran alley	12 37
Ashland avenue and Chester street	22 53
Central avenue and Allen alley	11 25
Central avenue and Pratt street	7 94
Broadway and Aliceanna street	65 66
Baltimore street and Grove alley	32 48
Valley street, near Eager street	82 25

Charles and Twenty-fifth streets	$ 80 11
Hunter alley and Twenty-fourth street	115 59
Hoffman street and Greenmount avenue	75 40
Camden street, between Howard and Sharp streets	317 63
Peck's Branch and North avenue	289 49
St. Paul street, north of Thirty-first street	89 42
Ann and Lombard streets	91 55
Calhoun street sewer	8 21
Cross and Hanover streets, 7 inlets	309 66
German street, opposite Arch street	67 61
Water gauges	38 68
	$7,060 95
Charged to Improvement in and Additions to Drainage System, appropriation 1902	170 13
Charged to Repairs of Sewers, appropriation 1902	6,890 82
	$7,060 95

INLETS REMODELED AND TRAPPED.

Lexington and Howard streets	$114 85
Register and Gough streets	136 60
North avenue and Boone street, 2 inlets	219 00
Ann and Gough streets, 2 inlets	242 94
Central avenue and Mullikin street, 2 inlets	315 95
	$1,029 34
Charged to improvements in and additions to drainage system, appropriation 1901	$38 75
Charged to improvements in and additions to drainage system, appropriation. 1902	96 95
Charged to repairs of sewers, appropriation 1902	893 64
	$1,029 34

INLETS CLEANED OF OBSTRUCTION.

Central avenue and Mullikin street inlet	$ 3 33
Hammond alley sewer	18 63
	$21 96

Charged to repairs of sewers, appropriation 1902.

NEW INLETS TO EXISTING SEWERS.

Twenty-fifth street, east of York Road	$115 33
Boston and Patuxent streets, 3 inlets	888 15
Henrietta and Howard streets, 3 inlets	521 88
Howard and Wayne streets	217 92
Druid Hill avenue and Clendenin street	143 03
South and Cable streets	111 45
Gorsuch avenue sewer	47 91
Lanvale and Washington streets	133 38
Bloom and Division streets	188 94
Hoffman street and Homewood avenue	197 60
St. Paul and Twenty-first streets, 2 inlets	355 83
	$2,921 42

Charged to Improvements in and Additions to Drainage System, appropriation 1901	$200 00
Charged to Improvements in and Additions to Drainage System, appropriation 1902	977 28
Charged to Repairs of Sewers, appropriation 1901	292 50
Charged to Repairs of Sewers, appropriation 1902	1,451 64
	$2,921 42

NEW MANHOLES TO EXISTING SEWERS.

Lanvale street and Broadway	$57 15
Druid Hill avenue and Clendenin street	98 71
Howard and Camden streets	87 24
Liberty street, near Lombard street	62 19
Broadway and Townsend street	59 83
Lovegrove alley sewer, 5 manholes	655 13
Howard and Camden streets	237 06
North and Patterson Park avenues	177 86
	$1,435 17

Charged to repairs of sewers, appropriation 1902.

MANHOLES IN INLET COVERS.

Bloom and Division streets	$15 50
Camden and Light streets	15 50
Lombard and Light streets	15 50
Washington and Lanvale streets, 2 inlets	21 75

Lexington and Howard streets	14 87
Townsend and Castle streets, 2 inlets	24 38
Homewood avenue and Hoffman street	15 50
Hoffman street, opposite Homewood avenue	15 50
Cross and Hanover streets, 2 inlets	25 99
Race and West streets, 3 inlets	33 25
West street, east of Race street	14 50
Race and Cross streets, 4 inlets	47 00
Chapel and Federal streets, 2 inlets	26 00
Greenmount avenue and Eager street, 3 inlets	36 50
Homewood avenue and Eager street, 2 inlets	26 00
Eager and Valley streets, 2 inlets	24 37
Hanover and Cross streets, 5 inlets	55 00
Fulton avenue and Baker street, 3 inlets	28 38
North avenue and Boone street, 2 inlets	26 00
Guilford avenue and Chase street, 3 inlets	34 06
Biddle and Ensor streets, 4 inlets	46 00
Boston and Patuxent streets	15 50
Charles and Cross streets, 2 inlets	22 75
Pennsylvania avenue, near Sewell street	15 50
Howard and Warner streets	15 50
Calhoun and McHenry streets	15 50
Fulton avenue and Eagle street	15 50
Read and Calvert streets, 2 inlets	26 00
Oliver and Wolfe streets, 2 inlets	24 38
Columbia avenue and Stockholm street, 3 inlets	33 25
Carroll and Stockholm streets	12 25
Federal street and Hopkins avenue, 2 inlets	26 00
St. Paul and Twenty-first street, 2 inlets	26 00
Pearl and Fayette streets	15 50
Fremont and Hollins streets	15 50
Charles and Twentieth streets	15 50
Lovegrove alley and Twentieth street	15 50
Edmondson avenue and Calhoun street	26 00
Fremont and Lombard streets	15 50
Gilmor and Calhoun streets	15 85
Howard and Henrietta streets, 3 inlets	38 60
Milton avenue and Preston street	16 20
Gay street, near Patterson Park avenue	16 20
Clendenin street and Druid Hill avenue, 2 inlets	31 00
Milton avenue and Preston street, 2 inlets	27 00
Calhoun street and Harlem avenue	19 80

Maryland avenue and Oliver street	$16 20
Franklin and Calhoun streets, 2 inlets	25 60
Calhoun and Saratoga streets, 2 inlets	23 80
Stricker and Saratoga streets, 2 inlets	27 40
Stricker and Franklin streets, 2 inlets	27 40
Carey and Franklin streets	16 20
	$1,214 43

Charged to Improvements in and Additions to Drainage System, appropriation 1902	$374 50
Charged to Repairs of Sewers, appropriation 1902	839 93
	$1,214 43

RECAPITULATION.

Recapitulation.	Repairs of Sewers.	Improvem'ts in and Additions to Drainage System.
Twenty-ninth street and Hudson alley sewer	.....	$813 58
Clement street sewer	$163 15	48 86
Twenty-first street sewer	.....	307 07
Park Heights avenue and Gordon lane sewer	.....	1,959 48
Fulton avenue and Baker street sewer	118 59	1,148 35
Carroll avenue sewer	.....	168 77
Central avenue sewer	9,529 93	.....
Hammond alley sewer	3,853 28	.....
Jenkins' run sewer	1,214 09	.....
Centre street sewer	963 47	.....
Ogier's Run sewer	.....	180 53
Gay street and Patterson Park avenue	.....	3,585 13
New manholes to existing sewers	1,435 17	.....
New inlets to existing sewers	1,744 14	1,177 28
Inlets remodeled and trapped	893 64	135 70
Manholes in inlet covers	839 93	374 50
Inlets cleared of obstruction	21 93	.....
Repairs to inlets and sewers	6,890 82	170 13
	$27,668 14	$10,069 38

Repairs of sewers, appropriation 1902	$28,500 00
Balance from repairs of sewers, appropriation 1901	292 50
Received from Water Department	67 61
	$28,860 11
Expended 1902	27,668 14
Balance on hand	$1,191 97
Improvements in and additions to drainage system, appropriation 1902	$10,000 00
Balance from improvements in and additions to drainage system, appropriation 1901	238 72
	$10,238 75
Expended 1902	10,067 38
Balance on hand	$169 37

REPORT OF

JOHN S. PATTERSON, Assistant City Engineer.

1902.

Department of Public Improvements.

Sub-Department of City Engineer.

City Engineer's Office,

Baltimore, January 1st, 1903.

Mr. B. T. Fendall,

City Engineer.

Sir—I herewith respectfully submit a report of all work done by your direction and under my supervision for the fiscal year ending December 31st, 1902.

This includes the repairing of cobble or rubble stone, Belgian, asphalt and mosaic block, sheet asphalt and vitrified brick pavements, the paving of improved rubble-stone pavements, the laying of new footway crossings of flag stones and vitrified bricks, the repairing of iron-covered gutters, granolithic gutters, unpaved streets, macadam roads, avenues and lanes, wooden drain boxes, the repaving over Chesapeake and Potomac Telephone Company's subway extensions, the Consolidated Gas Company's mains and services, the Baltimore Refrigerating and Heating Company's mains, over-drain pipes of private individuals and those from City property; the supervision of the construction of new electric street and steam railway tracks, and of general repairs along all street railway tracks.

The Department's property yard was also under my charge.

REPAIRS OF COBBLE OR RUBBLE-STONE PAVED STREETS.

The general plan in force for the past two years as to the selection of foremen to take charge of the paving gangs was continued last year, and was on the whole satisfactory, both

as to the quantity and quality of the work accomplished, although a reference to the tables hereto attached will show a slight increase in the cost of work over that of last year.

This is entirely due to the difficulty experienced in obtaining the necessary material to keep the gangs constantly at work.

The failure of the contractors to furnish material promptly resulted in a considerable loss to the city, though how much it is impossible to estimate or even approximate.

The men will not use their best efforts when there is no material in sight, and the foreman hesitates to lay his gang off, as he is expecting, on the promise of the contractor, the material he has ordered to arrive at any moment.

And even when the gang is laid off there is constantly more or less expense in the maintenance of lights, etc.

The combination which evidently existed among the stone men made it impracticable to remedy this evil, although a carload of gutter-stone was gotten outside, and the difference of price was charged against and paid for by the contractor.

It was also found necessary to condemn considerable gutter-stone and some kerbstone as not being up to the specifications, which also was the cause of some delay.

Notwithstanding the increased cost of labor per square foot, as explained above, and the increase of the price of materials furnished by the contractors, the total cost per square foot of repaving was little greater than last year, the difference being made up by using cobble and gutter stones taken from streets being laid with improved pavements.

In former years all old cobble-stones taken up from streets upon which improved pavements were laid were obtained for use in repairing streets at no cost other than that of hauling, while this year the streets repaved with improved pavements were given credit for the stones and the charge therefor made against the fund for "Repairs of roads, streets, etc.," thereby making the cost of repairs slightly in excess of what it otherwise would be.

The contractors putting down the improved pavements, by their contracts, were required to haul away the old cobble and gutter stones to a point designated, one block from the work.

As they had to load the stone contracts were made with them to haul the additional distance necessary to deliver the material to the repair gangs.

In connection with the cobble-stone repaving long stretches of old slab kerb were removed from Caroline, Aisquith, Charles and Hill streets and replaced by new four and one-half (4½) inch standard kerb.

On many of the streets repaved practically all new material had to be used; this was necessary on account of inferior material originally used and a general depreciation.

This was especially true on Caroline, Aisquith, McElderry and several streets in south Baltimore.

Wherever mention is made of streets repaired from rail or rails to kerb, it signifies that the repairs were made to within two feet of the rail, the balance being done by the United Railways and Electric Company at its expense, as required by ordinance of the Mayor and City Council.

All gabbro or nigger-head stones too small for repairing were sold to the Maryland Pavement Company for use in manufacturing asphalt blocks.

A ticket was given by the company for each load of stone taken, and during the year it hauled fourteen hundred and forty-seven (1,447) loads, for which a bill was rendered.

The wrecking of the gutters and kerb in many places throughout the City is of annual occurrence in the months of January, February and March, and entirely due to surface drainage.

The expense incurred in the making of such repairs is not only a considerable item to the City, but also a source of much inconvenience and expense to property-holders in repairing their sidewalks.

The following is a list of streets and alleys and how repaired:

LIST OF STREETS AND ALLEYS REPAIRED.

Street, Avenue or Alley.	Location.	How Repaired.
Lombard street...	Between west side of Stricker street and east side of Gilmor street.....	Kerb and gutter reset.
Calhoun street ...	Between north side of Lombard street and south side of Hollins street.....	Kerb to kerb.
Calhoun street ...	Between south side of Hollins street and south side of Baltimore street...	Patched.
Hollins street	Between west side of Carey street and east side of Calhoun street.....	Kerb to kerb.
Carey street.....	Between south side of Hollins street and north kerb of Lombard street...	Kerb to kerb.
Lombard street...	Intersection of Carey street.....	North side, rail to kerb.
Christian street...	Between west side of Payson street and east side of Pulaski street	Patched.
Vincent street....	Between north side of Fayette street and south side of Lexington street..	Kerb to kerb.
Calhoun street ...	Between north side of Baltimore street and south kerb of Fayette street....	Kerb to kerb.
Calhoun street ...	Intersection of Fayette street.....	Rails to kerb.
Calhoun street ...	Between north kerb of Fayette street and south side of Lexington street..	Kerb to kerb.
Fayette street ..	Between west side of Carey street and east side of Calhoun street	Rails to kerb.
Carey street.....	Between north side of Fayette street and south side of Lexington street..	Rail to west kerb.
Norris alley.....	Between north side of Ramsay street and south side of McHenry street...	Kerb to kerb.
Norris alley.....	Between north side of McHenry street and south side of Pratt street.....	Kerb to kerb.
Ramsay street....	Between west side of Calhoun street and east side of Stricker street.....	North side, patched.
Ramsay street....	Between east side of Stricker street and east side of Gilmor street.....	Kerb to kerb.
Ramsay street....	Between east side of Payson street and east side of Pulaski street	Kerb to kerb.
Ramsay street....	Intersection of Smallwood street.....	Building line to building line
Ramsay street....	Between east side of Addison alley and west side of Fulton avenue.....	Kerbs and gutters reset.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Fulton avenue...	Between south side of Cole street and north side of Eagle street.....	West kerb and gutter.
Lombard street...	Between west side of Monroe street and east side of Payson street.....	Kerbs and gutters.
Stricker street....	Between south side of Lemon street and south side of Lombard street...	Kerb to kerb.
Lombard street...	Between west side of Stricker street and east side of Gilmor street	South side, rail to kerb.
Franklin street...	Between west kerb line of Calvert street and east side of Courtland street.....	South side, kerb and gutter reset.
Hamilton street..	Between west side of St. Paul street and west side of Morton street.. ...	Kerb and gutter reset.
Stricker street....	Between south side of Presstman street and north side of Patterson avenue.	East side, kerb and gutter reset.
Mount street.....	Between north side of Harlem avenue and 10-foot alley north of same.....	East side, gutter reset.
Spear's wharf....	South of Pratt street about 100 feet ..	Kerb to dock.
Commerce street..	South of Pratt street.....	Patched.
Vine street	Between west side of Stricker street and south side of Gilmor street	Mostly repaved.
Vine street	Between west side of Schroeder street and east side of Carlton street	Kerb to kerb.
Schroeder street..	Between north side of Lexington street and south side of Saratoga street ...	Kerb to kerb.
Schroeder street..	Intersection of Saratoga street.....	South kerb to rail.
Amity street	Between north side of Lexington street and south side of Saratoga street ...	Patched.
Wagon alley.....	Between west side of Schroeder street and east side of Arlington avenue ..	Kerb to kerb.
Bethany lane	Between east side of Carey street and 10-foot alley east of Carey street	Kerb to kerb.
Saratoga street ...	Between west side of Arlington avenue and east side of Carlton street	Patched.
Harmony lane ...	Between east side of Carrollton avenue and west side of Arlington avenue..	Kerb to kerb.
Harmony lane...	Between east side of Arlington avenue and west side of Schroeder street....	Kerb to kerb.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Arlington avenue.	Between north side of Franklin street and south side of Edmondson avenue	Kerb to kerb.
Brune street	Between south side of Harlem avenue and north side of Edmondson avenue	Kerb to kerb.
Brune street	Intersection of Edmondson avenue ..	Building line to building line
Brune street.....	Between south side of Edmondson avenue and north side of George street .	Kerbs reset and patched.
Brune street.....	Intersection of George street.....	Building line to building line
Brune street.....	Between south of George street and north side of Franklin street	Kerbs reset and patched.
Harlem avenue ..	Between west side of Myrtle avenue and east side of Brune street.....	South kerb reset and patched
Harlem avenue ..	Between west side of Brune street and east side of Franklin street.....	South kerb reset and patched
Dolphin street....	Between west side of Upton street and east side of Fremont avenue.....	Patched.
Edmondson ave..	Between west side of Fremont avenue and east side of Gilbert street.....	North side, rail to kerb.
Edmondson ave..	Between west side of Arlington avenue and east side of Carrollton avenue ..	North side, patched.
Edmondson ave..	Between east side of Carey street and west side of Carrollton avenue	South side, kerb reset and patched.
Milton Place.....	Between west side of Fremont avenue and east side of Schroeder street....	Kerbs reset and patched.
Milton Place. ...	Between west side of Schroeder street and east side of Arlington avenue...	Patched.
Schroeder street..	Between south side of Edmondson avenue and north side of Franklin street	Kerbs to rail.
Schroeder street..	Between south side of Franklin street and north side of Mulberry street...	West side, kerb to rail.
Arlington avenue.	Between north side of Hollins street and south side of Baltimore street ..	Kerb to kerb.
Arlington avenue.	Between north side of Lombard street and south side of Hollins street.....	Kerb to kerb.
Carrollton avenue	Between south side of Hollins street and north side of Lombard street ..	Kerb to kerb.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Carrollton avenue	Between south side of Lombard street and north side of Pratt street.....	Patched.
Penn street	Between north side of Lombard street and south side of German street	Kerb to kerb.
Cider alley.....	Between east side of Penn street and west side of Greene street.....	Kerb to kerb.
Arch street.....	Between north side of German street and south side of Baltimore street...	Kerb to kerb.
Howard street....	Between north side of Centre street and south side of Little Ross street..	East side, new 4½-inch kerb and gutter reset.
Maryland avenue.	Between north side of Oliver street and south end Jones' Falls bridge...	West side, kerb to rail.
Adams alley	Between west side of Maryland avenue and a point 150 feet westerly.....	Building line to building line.
North avenue....	Intersection of Oak street.....	Entirely.
Ducatel street....	Between east side of Linden avenue and west side of 10-foot alley	South side, center to kerb.
Newington avenue	Between east side of Callow avenue and east side of 10-foot alley.....	North side, center to kerb.
Newington avenue	Between west side of Callow avenue and west side of 10-foot alley.....	North side, center to kerb.
Jordan alley.....	Between north side of Laurens street and south side of Robert street	Patched.
Foster alley.....	Between south side of Mosher street and north side of Lafayette avenue..	Kerb and gutter, reset and patched.
Foster alley.....	Between south side of Lafayette avenue and a point 100 feet south.....	Gutter reset and patched.
North avenue....	Between west side of Pennsylvania avenue and east side of Mount street..	North side patched.
Lorman street....	Between west side of Fulton avenue and a point 150 feet westerly.....	South side, 80 feet new, center to kerb.
Lorman street....	Between east side of Fulton avenue and west side of Mount street.....	Kerb reset and patched.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Fremont avenue..	Between north side of Presstman street and southwest side of Pennsylvania avenue.....	Kerb to kerb.
Pennsylvania ave.	Between north side of Presstman street and southeast side of Fremont avenue	West side, kerb and gutter reset.
Chappell street...	Between west side of Pennsylvania avenue and east side of Carey street.	Patched.
Pennsylvania ave.	Between north side of Bloom street and south side of Gold street	West side, kerb and gutter reset.
Pennsylvania ave.	Between north side of Baker street and south side of Cumberland street.	East side, 150 feet kerb and gutter reset.
Etting street.....	Between north side of Gold street and south side of 10-foot alley	West side, kerb and gutter reset.
Morris alley.....	Between south side of Lafayette avenue and north side of Lanvale street.	Building line to building line.
North avenue....	Intersection of Park avenue.....	Patched.
Laurens street....	Between west side of Park avenue and east side of Jenkins alley.....	Pavement over sewer shaft raised.
Laurens street....	Between west side of Jordan alley and east side of Eutaw Place.....	Pavement over sewer shaft raised.
Hamilton street..	Between west side of St. Paul street and east side of Lovegrove alley....	Patched.
Center street.....	Between west side of Calvert street and east side of St. Paul street.....	Patched.
Hargrove alley...	Between south side of Center street and north side of Franklin street...	Kerb to kerb.
Hargrove alley...	Between south side of Franklin street and north side of Pleasant street....	Patched.
Hamilton street..	Between west side of Hargrove alley and east side of St. Paul street	Kerbs reset and patched.
Mulberry street...	Intersection of Courtland street	Kerb reset and patched.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
North alley.....	Between west side of Charles street and east side of Center street.....	Kerb reset and patched.
North alley.....	Between west side of Cathedral street and east side of Park avenue.....	Kerb reset and patched.
Wilson alley.....	Between west side of Park avenue and east side of Tyson alley.....	Gutter reset and patched.
Waesche street...	Between east side of Fremont avenue and a point 350 feet easterly.....	Kerb to kerb.
Sterrett alley.....	Between southwest side of Barre street and a point 200 feet south of Woodward street.....	Kerb to kerb.
St. Peter street...	Between east side of Scott street and west side of Barre street.....	Kerb to kerb.
Mulberry street...	Between west side of Pine street and east side of Myrtle avenue.....	Kerb to kerb.
Mulberry street...	Between west side of Myrtle avenue and east side of Fremont avenue....	Kerb to kerb.
Pine street.....	Between south side of Bradley street and south side of George street.....	Kerb to kerb.
George street.....	Between east side of Myrtle avenue and west side of Pine street.....	Patched.
George street.....	Intersection of Pine street.....	Building line to building line
George street.....	Between east side of Pine street and west side of Pennsylvania avenue..	Kerb to kerb.
Biddle street.....	Between east side of George street and west side of Argyle avenue.....	Kerb to kerb.
Little Pine street.	Between south side of Greenwillow street and north side of George street.	Entirely.
Greenwillow street	Between southeast side of Myrtle avenue and west side of Argyle avenue.	Kerb to kerb.
Greenwillow street	Intersection of Argyle avenue.....	Rails to kerbs.
Greenwillow street	Between east side of Argyle avenue and west side of Pennsylvania avenue	Patched.
Union street.....	Between east side of Pennsylvania avenue and west side of Druid Hill avenue.....	Kerbs reset and patched.
Pear street.....	Between north side of Biddle street and south side of Preston street....	Patched.
St. Mary street...	Between west side of Pennsylvania avenue and east side of Tessier street..	Kerb to kerb.
Moore street.....	Between east side of Tessier street and west side of Druid Hill avenue.....	Kerb to kerb.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Shields alley.....	Between north side of Greenwillow street and south side of Hoffman street.....	Kerb to kerb.
Shields alley.....	Between north side of Hoffman street and south side of Dolphin street....	Patched.
Shields alley.....	Between north side of Dolphin street and south side of Lanvale street....	Gutter reset and patched.
Shields alley.....	Between north side of Lanvale street and south side of Lafayette avenue.	Gutter reset and patched.
Shields alley.....	Between north side of Lafayette avenue and south side of Mosher street.	Kerb and gutter reset and patched.
Myrtle avenue...	Between north side of Dolphin street and south side of Lanvale street ...	Kerbs to rail.
Myrtle avenue....	Intersection of Lanvale street.....	Patched.
Mosher street.....	Between east side of Myrtle avenue and west side of Argyle avenue....	South side, kerb reset and patched.
Argyle avenue....	Between north side of Mosher street and south side of Smith street.....	West side, kerb reset and patched.
Argyle avenue....	Between south side of Mosher street and a point 100 feet southerly.....	Kerb and gutter reset.
Smith street.....	Between west side of Argyle avenue and east side of Shields alley.....	South side, kerb and gutter reset.
Maryanna street..	Between west side of Forest street and east side of Smallwood street...	Kerb to kerb.
Pratt street.....	Between west side of Gilmor street and east side of Vincent alley	South side, kerb and gutter reset.
Pratt street.....	Between west side of Stricker street and east side of Parrish street.....	South side, kerb and gutter reset.
Pratt street.	Between west side of Scott street and east side of Bartlett street	South side, kerb to rail.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Fremont avenue..	Between north side of Baltimore street and north side of Raborg street	West side, kerb to rail.
Fayette street....	Between west side of Park avenue and east side of Howard street	South side, kerb to rail.
Fayette street....	Between west side of Park avenue and east side of Howard street..	Northside, kerb to rail 100 lin. feet.
Fayette street....	Between west side of Eutaw street and east side of Paca street	Rails to kerb.
Fayette street....	Between west side of Paca street and east side of Greene street.....	Rails to kerb.
Fayette street....	Between west side of Greene street and east side of Pearl street.....	Rails to kerb.
Fayette street....	Between west side of Pearl street and east side of Arch street	Rails to kerb.
Fayette street....	Intersection of Arch street	Patched.
Marion street.....	Between west side of Park avenue and east side of Howard street	Kerb to kerb.
Marion street.....	Between west side of Howard street and east side of Eutaw street.....	Kerb to kerb.
Wyoming street..	Between east side of Little Sharp street and west side of Crooked lane.	Kerb to kerb.
Crooked lane	Between north side of Wyoming street and south side of Lexington street..	Patched.
Stable alley.....	Between north side of Pratt street and south side of Lombard street.....	Entirely.
North street.....	Between north side of Pleasant street and north side of Bath street.....	East side patched.
Little Monument street	Between southeast side of McCulloh street and east side of St. Mary street	Patched.
Little Monument street.....	Between west side of St. Mary street and east side of Orchard street.....	Patched.
Orchard street ...	Between north side of Druid Hill avenue and south side of McCulloh street	Kerb to kerb.
Orchard street. ..	Between north side of McCulloh street and south side of Madison avenue..	Kerb to kerb.
Aliceanna street..	Between President and Albemarle streets.....	Rails to gutters
Caroline street ...	Between Dock and Lancaster streets.	Rails to kerbs.
Point street.....	Between Philpot and Block streets ..	Kerb to kerb.
Dock street	Between Caroline and Dallas streets .	Kerb to kerb.
Block street.....	Between Point street and Jones' Falls	Patched.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Spring street.....	Between Pratt and Gough streets	Kerb to kerb.
Exeter street.....	Between Bank and Fawn streets.....	Rails to kerbs.
Stiles street	Between High and Exeter streets....	Kerb to kerb.
High street	Between Lombard and Baltimore streets.....	Rails to kerbs.
Exeter street.....	Between Stiles and Pratt streets	Patched.
Granby street	Between High and Exeter streets....	Patched.
High street.....	Between Granby and Lombard street.	Kerb to kerb.
High street.....	Between Pratt and Fawn streets. ...	Patched.
Fawn street.....	Between High and Albemarle streets.	Kerb to kerb.
High street	Between Fawn street and Eastern avenue	Patched.
Granby street	Between High and Albemarle streets.	Patched.
Albemarle street .	Between Pratt and Stiles streets.....	Patched.
Gough street.....	Between Stiles and Granby streets ...	Kerb to kerb.
Pratt street	Between Caroline and Bond streets ..	Patched.
Central avenue...	Between Gough and Granby streets..	Kerb to kerb.
Philpot alley.....	Between Gough street and Central avenue	Patched.
Stiles street	Between Gough street and Central avenue	Kerb to kerb.
Twenty-third st..	Between Hampden and Mt. Vernon avenues	Kerb to kerb.
Twenty-fourth st.	Between Hunter and Hargrove alleys	Kerb to kerb.
Barclay street....	Between North and Lafayette avenues	Kerb to kerb.
Calvert street	Between Lanvale street and Lafayette avenue	Patched.
Spring street.....	Between Federal and Lanvale streets.	Kerb to kerb.
Preston street....	Between Gay and Bond streets	Rails to kerbs.
Caroline street ...	Between Biddle and Preston streets..	Rails to kerbs.
Ashland avenue..	Between Hopkins avenue and Washington street.....	Rails to kerbs.
Durham street ...	Between Ashland avenue and Eager street.....	Patched.
Wolfe street	Between Madison and Eager streets..	Patched.
Madison street ...	Between Hopkins avenue and Wolfe street.....	Kerb to kerb.
Federal street....	Between Washington street and Broadway	Kerb to kerb.
Dallas street	Between Lafayette avenue and 150 feet south of North avenue..... ...	Kerb to kerb.
Dallas street.....	Between 150 feet south of North avenue and North avenue.....	Patched.
Gough street.....	Between Spring and Caroline streets.	South side, rail to kerb.
Gough street....	Between Spring and Caroline streets.	North side, patched.
Gough street.....	Between Caroline and Bond streets ..	Patched.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Caroline street...	Between Gough and Orleans streets..	Kerb to kerb.
Lombard street ..	Between Bethel street and Broadway.	Kerb to kerb.
Lombard street ..	Between Bethel and Dallas streets...	Patched.
Fairmount ave...	Between Eden and Spring streets....	Kerb to kerb.
Low street.....	Between Rogers avenue and Forrest street.....	Kerb to kerb.
Madison street...	Between Buren and Graves streets..	Kerb to kerb.
Madison street...	Between Graves and Forrest streets..	Patched.
Colvin street.....	Between Hillen and Front streets....	Kerb to kerb.
Monument street.	Between Calvert street and Greenmount avenue.	Patched.
Constitution st...	Between Front and Monument streets	Kerb to kerb.
Bowley street ...	Between Pratt and Cable streets.....	Patched.
Spear's Wharf...	Between Pratt street and Basin.....	Patched.
Buchanan's Whf.	Between Pratt street and Basin.....	Patched.
Smith's Wharf...	Between Pratt street and Basin.....	Kerb to kerb.
Pratt street.....	Between Central avenue and Eden street.....	South side, rail to kerb.
Pratt street.....	Between Caroline and Eden streets..	Rails to kerbs.
Allen alley.....	Between Central avenue and Exeter streets.....	Kerb to kerb.
Duncan alley....	Between Lombard and Baltimore streets	Kerb to kerb.
Madeira street....	Between Orleans and Fayette streets.	Kerb to kerb.
Commerce street.	Between Pratt street and Basin.....	Patched.
President street..	Between Canton and Eastern avenues	Rails to kerbs.
Canton avenue...	Between President street and East Falls avenue.....	Kerb to kerb.
East Falls avenue.	Between Canton avenue and Alice Anna street.	Kerb to kerb.
Alice Anna street.	Between President street and East Falls avenue..... .	Patched.
Wills street.....	Between Dock and Block streets.....	Kerb to kerb.
Point street.....	Between Dock and Block streets.....	Patched.
Dock street.....	Between Caroline and Block streets.	Patched.
Thames street...	Between Bond street and Broadway..	Rails to kerbs.
Caroline street....	Between Dock and Thames streets...	Patched.
Alice Anna street.	Between Caroline street and Central avenue	Rails to kerb.
Eden street.....	Between Lancaster and Alice Anna streets	Kerb to kerb.
Canton avenue...	Between Caroline and Spring streets.	Rails to kerbs.
Caroline street...	Between Canton and Eastern avenues.	Patched.
Wolfe street.....	Between Thames and Alice Anna streets.....	Kerb to kerb.
Wolfe street.....	Between Thames and Fell streets. ..	Patched.
Thames street....	Between Wolfe street and Harbor....	Patched.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Bank street.....	Between Collington and Patterson Park avenues.....	North side, rail to kerb.
Bank street.....	Between Collington and Patterson Park avenues.....	South side, patched.
Bond street.....	Between Eastern avenue and Pratt street...	Rails to kerbs.
Eastern avenue...	Between Bond and Ann streets.....	Patched.
Eastern avenue ..	Between Lakewood avenue and Chesapeake street.....	South side, rail to kerb.
Chapel street.....	Between Lombard and Pratt streets..	Kerb to kerb
Cypress alley.....	Between Pratt and Lombard streets..	Entirely.
Sutton street.....	Between Lombard and German streets	Patched.
Conway street....	Between Light and Sharp streets.....	Rails to kerbs.
Camden street....	Between Charles and Hanover streets.	Kerb to kerb.
York street.....	Between Howard and Sharp streets..	Kerb to kerb.
Elliott street.....	Between Boston and Chesapeake streets.....	Kerb to kerb.
Montford avenue.	Between Boston street and Foster avenue	Patched.
Eastern avenue..	Between Mill street and West Falls avenue	Kerb to kerb.
President street..	Intersection of Stiles street.....	Remodeled.
Lombard street...	Between Harrison and Concord streets	South side, rail to kerb.
Patterson Park ave	Between North avenue and Gay street	Rails to kerbs.
Townsend street..	Between Gay street and Montford avenue	Patched.
Preston street....	At bridge over Jones' Falls	Around sewer inlets.
Cable street.....	Between Bowly and South streets...	Kerb to kerb.
South street.....	Between Cable street and Basin.....	Kerb to kerb.
Aisquith street...	Between Baltimore and Fayette streets	Rails to kerb.
Aisquith street...	Between Fayette and Lexington streets	Patched.
Aisquith street...	Between Lexington and Gay streets..	Rails to kerbs.
Mullikin street...	Between Central avenue and Aisquith street	Kerb to kerb.
Lewis street... ..	Between Mullikin and Orleans streets	Kerb to kerb.
Low street.....	Between Forrest and Aisquith streets.	Kerb to kerb.
McElderry street.	Between Central avenue and Aisquith streets	Kerb to kerb.
Spring street....	Between McElderry and Monument streets	Kerb to kerb.
Spring street.....	Between Madison street and Ashland avenue	Kerb to kerb.
Lexington street..	Between Eden and Aisquith streets..	Rails to kerbs.

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Hulls lane	Between Forrest and Aisquith streets.	Kerb to kerb.
Monument street.	Between Spring and Chapel streets...	Rails to kerbs.
Abbott street....	Between Bond street and Broadway .	Kerb to kerb.
Barnes street.....	Between Bond street and Broadway .	Kerb to kerb.
Chapel street.....	Between Ashland avenue and Eager street	Kerb to kerb.
Stirling street....	Between Ashland avenue and Eager street	Patched.
Eden street	Between Monument and Madison streets	Kerb to kerb.
Fairmount avenue	Between Spring and Caroline streets.	Kerb to kerb.
Jackson Place ...	Between Fayette street and Fairmount avenue	East side, kerb to kerb.
Cross street.....	Between east side of Light street and east side of Belt street	Kerb to kerb.
William street....	Between south side of Cross street and north side of West street	Kerb to kerb.
Hall alley.....	Between south side of Cross street and north side of West street	Kerb to kerb.
Belt street	Between south side of Cross street and south side of Belt lane	Kerb to kerb.
Belt lane.....	Between south side of Belt street and Jackson street	Patched.
James lane	Between south side of Weyler street and north side of West street	Kerb to kerb.
James alley.....	Between north side of Cross street and south side of Hamburg street	Kerb to kerb.
William street....	Between south side of Hamburg street and north side of Cross street	Kerb to kerb.
Durst alley.....	Between south side of Cross street and north side of West street	Patched.
Hughes street. ..	Between east side of Light street and east side of William street	Kerb to kerb.
Riverside avenue.	Between south side of Cross street and south side of Fort avenue	Kerb to kerb.
Armistead lane...	Between east side of William street and west side of Battery avenue ...	Patched.
Riverside avenue.	Between south side of West street and north side of Clement street	Patched.
Riverside avenue.	Between south side of Randall street and north side of Fort avenue	Patched.
Battery avenue...	Intersection of Montgomery street ...	Patched.
Fort avenue.....	Between east side of Charles street and west side of Light street.... ..	Rails to kerbs.
Patapsco street...	Between north side of Fort avenue and north side of Beverly street....	Patched.
Charles street	Between north side of Cross street and south side of Barre street	Rails to kerbs

LIST OF STREETS AND ALLEYS REPAIRED.—Continued.

Street, Avenue or Alley.	Location.	How Repaired.
Cross street.....	Between west side of Charles street and east side of Hanover street.....	Patched.
Fort avenue.....	Intersection of Light street.....	Entirely.
Henrietta street..	Between east side of Charles street and west side of Light street.....	Kerb to kerb.
Montgomery st...	Between west side of Charles street and east side of Hanover street.....	Kerb to kerb.
Hughes street....	Between east side of Charles street and and west side of Light street.....	Patched.
Hill street	Between west side of Hanover street and east side of Sharp street.....	Kerb to kerb.
Ropewalk lane ...	Between east side of Charles street and west side of Patapsco street.....	Kerb to kerb.
Barre street.....	Between west side of Charles street and east side of Hanover street.....	Kerb to kerb.
Cross street	Between south side of Race street and north side of Leadenhall street	Kerb to kerb.
Leadenhall street.	Between north side of Cross street and north side of Hamburg street.....	Patched.
Charles street	Between south side of Cross street and north side of West street.....	Rails to kerbs.
Charles street	Between south side of West street and north side of Ostend street.....	East side, rail to kerb.
Hamburg street ..	Between west side of Hanover street and east side of Leadenhall street...	Patched.
Hughes street....	Between west side of Charles street and east side of Hanover street.....	Patched.
Leadenhall street.	Between north side of Stockholm street and south side of Cross street.	Kerb to kerb.
West street.....	Between east side Leadenhall street and west side Race street	Kerb to kerb.
Henrietta street..	Between east side of Howard street and west side of Hanover street.....	Kerb to kerb.
Eutaw street.....	Between north side of West street and north side of Hamburg street.	Rail to kerb.
Cross street	Between east side of China alley and west side of Warner street.....	Patched.
Cross street	Between east side of Eutaw street and west side of Ohio avenue.	Patched.
Cross street	Between east side of Howard street and west side of Sharp street	Kerb to kerb.
Howard street . .	Between north side of West street and south side of Cross street.....	Rail to kerb.
Marshall avenue.	Between south side of Donaldson street and north side of Cromwell street...	Patched.
Winder street	Between east side of Marshall avenue and west side of Johnson street.....	North side, center to kerb.

LIST OF STREETS AND ALLEYS REPAIRED.—Concluded.

Street, Avenue or Alley.	Location.	How Repaired.
Andre street.....	Between north side of Fort avenue and north side of Clement street....	Kerb to kerb.
Linden avenue...	Between north side of Madison street and south side of Fifth avenue.....	Kerb to kerb.
Lovegrove alley..	Between north side of Eager street and south side of Chase street	Kerb to kerb.
Richmond street..	Between west side of Cathedral street and east side of Park avenue.....	Kerb to kerb.
Morton street	Between south side of Center street and north side of Hamilton street...	Kerb to kerb.
Center street.....	Between east side of Charles street and west side of St. Paul street..... ...	Patched.
Hamilton street..	Between west side of Cathedral street and east side of Park avenue.....	Patched.
Center street	Between west side of Charles street and east side of Howard street.....	Rail to kerb.
Chase street ...	Between west side of Park avenue and north side of Richmond street.....	Kerb to kerb.
Park avenue.....	Between south side of Tyson alley and south side of Chase street.....	West side, rail to kerb.
Lovegrove alley..	Between south side Read street and north side of Madison street.....	Patched.
Lovegrove alley..	Between north side of Read street and south side of Eager street	Patched.
German street....	Between west side of Eutaw street and west side of Paca street	Kerb to kerb.
Paca street.....	Between south side of German street and north side of Pratt street.....	Kerb to kerb.
Paca street.....	Between south side of Pratt street and Little Paca street.....	Kerb to kerb.
Paca street... ...	Between east side of Fremont avenue and east side of Little Greene street.	Kerb to kerb.
Front street.....	Between east side of Exeter street and west side of Forrest street	Kerb to kerb.
Front street.....	Between north side of Hillen street and west side of High street.....	Kerb to kerb.
High street	Between north side of Gay street and south side of Hillen street.....	Kerb to kerb.
Ensor street.....	Between east side of Colvin street and west side of Forrest street	Kerb to kerb.
Exeter street.....	Between north side of Hillen street and south side of Forrest street.....	Kerb to kerb.
High street.....	Between north side of Hillen street and south side of Forrest street.....	Kerb to kerb.

REPAIRS TO BELGIAN BLOCK PAVED STREETS.

More extensive repairs were made to streets paved with this kind of material the past year than has been done in any previous year since they were paved, and these were made in streets in the business section of the city.

The following is a list of the streets repaired :

Streets.	Location.	How Repaired.
Lexington street..	Between east side of Howard street and east side of Little Sharp street...	Rails to kerb.
Lexington street..	Between east side of Little Sharp street and west side of Crooked lane	Patched.
Lexington street..	Intersection of Howard street.....	Rails to kerb.
Howard street....	Between north side of Lexington street and south side of Clay street.....	Rails to kerb.
Howard street....	South of Franklin street about 100 feet	East side, rail to kerb.
Liberty street.....	Between north side of Baltimore street and south side of Fayette street.....	Rails to kerb.
Park avenue.....	Between south side of Fayette street and intersection of Liberty.....	Rails to kerb.
German street....	Between west side of Charles street and east side of Hanover street.....	Kerb to kerb.
German street....	Between west side of Hanover street and east side of Sharp street.....	Kerb to kerb.
German street....	Intersection of Sharp street.....	Entirely.
Sharp street.....	Between south side of German street and north side of Lombard street...	East and west sides, rail to kerb.
Sharp street.....	Insersection of Lombard street.....	Patched.
German street....	Intersection of Liberty street.....	Patched.
Calvert street.....	Between north side of Baltimore street and south side of Fayette street.....	Rails to kerb.
Baltimore street..	Between west side of Holliday street and east side of North street	North side, rail to kerb.
Baltimore street..	Between east side of Grant street and west side of St. Paul street.....	Rails to kerb.
Pratt street	Between west side of Stable alley and east side of Commerce street	Patched.
North avenue....	Intersection of McMechin street.....	Remodelled.
Light street.....	Between Conway and Lee streets.....	Patched.
Calvert street	Between Lexington and Center streets	Rails to kerb.
Boston street.....	Between Potomac and Streeper streets	North side, rail to kerb.
Boston street.....	Between Elliott and Chesapeake streets	Patched.
West Falls avenue	Between Canton and Eastern avenues	Kerb to wall.
Gay street	Between Collington and Montford avenues	Rails to kerb.

Streets.	Location.	How Repaired.
Gay street	Between Rogers avenue and Aisquith street.....	Rails to kerb.
Gay street	Between Rogers avenue and Chestnut street.....	Patched.
Gay street	Between Central avenue and Eden street.....	Rail to north-west kerb.
Pratt street	Between Light and Hollingsworth streets.....	South side, rail to kerb.
Lexington street..	Between Jones' Falls and Aisquith st.	Patched.

The following is a statement of the amount, character and cost of the work done by the large gangs at the above-named places:

2,428,599	square feet	cobblestone repaving at.....	$.0380	$92,432	11
178,866	" "	Belgian block repaving at....	.0417	7,458	96
33,081	" "	old flagstone reset at.....	.0834	2,758	96
617.8	" "	new flagstone set at.....	.3334	205.	97
104,409.3	lineal "	old gutter-stone reset at....	.0328	3,424	63
20,620.5	" "	new standard gutter-stone set at	.2828	5,831	47
7,426.2	" "	new hammer-dressed gutter-stone set at.....	.2328	1,728	82
69,284.1	" "	old 4½-in. kerbstone reset at..	.0707	4,898	39
6,899.4	" "	new 4½-in. kerbstone set at....	.6525	5,454	59
106	" "	new 4½-in. kerb circles set at..	1.30	137	86
4,381.5	" "	old 6-in. kerbstone reset at...	.13	569	60

The following is a statement of the amount and character of the work done by the small emergency gangs; each composed of a paver, rammer, carter and laborer, and the expense incident thereto, viz:

85,203	square feet	cobblestone repaved.		
23,968	" "	Belgian block repaved.		
229	" "	mosaic " "		
380	" "	asphalt " "		
323	" "	vitrified brick "		
3,454	" "	flagstone relaid.		
23,776	lineal "	gutterstone relaid.		
1,995	" "	6-inch kerbstone reset.		
18,386	" "	4½-inch kerbstone reset.		
81	" "	gutterstone grouted.		
	Expended	for labor.....	$8,151 44	
	"	" material.....	967 36	
				$9,118 80

COMPARATIVE COST OF NEW MATERIALS.

Materials.	1901.	1902.	Per Cent.	
			Increase	Decrease
Cobblestone per perch	$1.6795	$1.8148	$8\frac{1}{10}$	.....
Standard gutter-stone per lineal foot.	.28	.25	.....	$10\frac{7}{10}$
Hammer-dressed gutter-stone per lineal foot	.18	.20	$11\frac{2}{10}$	.....
$4\frac{1}{2}$-inch kerbstone per lineal foot	.55	.55	.....	.....
Flagstone per square foot	.28	.25	.....	$10\frac{7}{10}$
Sand per cubic yard	.5896	.5625	.....	$4\frac{6}{10}$
Cobble stone per square foot paved	.0028	.0052	$85\frac{7}{10}$	.....

COMPARATIVE COST OF LABOR FOR DIFFERENT KINDS OF WORK.

	1901.	1902.	Per Cent.	
			Increase	Decrease
Laying cobblestone per square foot	$ .0258	$ .0267	$3\frac{4}{10}$	.....
Laying Belgian blocks per square foot.	.0450	.0350	.....	$22\frac{2}{10}$
Laying mosaic blocks per square foot.	.0470	.0457	.....	$2\frac{8}{10}$
Setting flag stone per square foot	.0834	.0834	.....	.....
Setting gutter stone per lineal foot	.0328	.0328	.....	.....
Setting new $4\frac{1}{2}$-inch kerb stone per lineal foot	.....	.10	.....	.....
Setting old $4\frac{1}{2}$-inch kerb stone per lineal foot	.0707	.0707	.....	.....
Setting old 6-inch kerb stone per lineal foot	.....	.13	.....	.....

COMPARATIVE COST OF COBBLESTONE REPAVING.

	1901.	1902.	Per Cent.	
			Increase	Decrease
Square feet paved	2,155,191	2,428,599	$12\frac{7}{10}$	.....
Expended for labor	$55,630.60	$64,919.50	$16\frac{7}{10}$	.....
Cost per square foot for labor	.0258	.0267	$3\frac{4}{10}$	.....
Expended for materials	$24,147.36	$25,760.49	$6\frac{6}{10}$	.....
Cost per square foot for materials.	.0112	.0106	.....	$5\frac{4}{10}$
Total cost per square foot	.0370	.0373	$\frac{8}{10}$	.....

RENEWALS AND REPAIRS TO ASPHALT-BLOCK PAVED STREETS.

Considerable renewal and repair work was done to streets of this kind of pavement.

In many places the blocks were almost worn away and the pavement had to be renewed from kerb to kerb, even to the extent of entire blocks in a few cases.

All renewals and repairs were made during warm weather, which experience has proven to be the better time to lay new blocks, as they cement together and afterward retain the same uniform smooth surface as when first laid.

In making these renewals the blocks of the dimension 5x4x12 inches were most generally used, except in a couple of places, where those of the size 4x4x12 inches were used.

For the first time in laying new asphalt blocks those of the size 5x4x12 inches were laid with the larger area, sixty square inches, instead of forty-eight square inches, as the wearing surface.

Laid in this manner the blocks cost less than the 4x4x12 inch size, as the difference in surface area gained is more than compensated by the difference in price.

Thus far the experiment has been most satisfactory, as shown by the first pavement laid with blocks in this manner, in the intersection of Calhoun street and Lafayette avenue, during the latter part of April. The best of the old blocks taken up were cleaned and then used in making repairs in places where the pavement was not too badly worn, and no new blocks were mixed with them.

The few new ones used in conjunction with the repairs were laid along gutters.

In making renewals along streets in which street-railway tracks are laid I would recommend that the city, with the sanction of the street-railway company, do its work at the same time, so that the entire area paved from kerb to rail may have a uniformly smooth surface. Where the company now makes its own renewals or even repairs for two feet out-

side its tracks, the bond between the two portions of the pavement laid is imperfect and the surface uneven.

The location of all renewals made has been accurately measured and shown on a map on file in the office.

Asphalt blocks for renewals and the few used on repairs were furnished by the Maryland Pavement Company, at its contract price of six cents (.06 cts.) per block of the dimension 4x4x12 inches, and six and one-half cents (.06½ cts.) per block of the dimension 5x4x12 inches.

All other materials used were furnished under contracts. Renewals and repairs were done by day's labor by the city.

The total area renewed with new blocks was 8,401.52 square yards at a total cost of $13,743.65, an average cost of $1.635 per square yard.

The cost per square yard for labor is much less than that for the preceding years, with no change in the rate of wages.

The total area of repair work done with the best of the old blocks and the few new ones used was 8,913.72 square yards, at a total cost of $3,615.90, at an average cost of $.405 per square yard.

The following is a list of streets upon which renewals and repairs were made, the number of square yards paved and repaired, and the cost per square yard for labor and materials.

Lexington street, between Pearl street and Fulton avenue:

Renewing.

		Total Cost.	Cost Per Square Yard.
Labor tearing out and laying 2,231.668 sq. yds.		$ 394 65	$0.1768
47,045	5x4-inch blocks used at .06½.....	3,057 92	1.3702
1,300	4x4-inch blocks used at .06.....	78 00	0.0349
144.5	cu. yds. screened sand at .75.....	108 38	0.0485
41.97	cu. yds. stone dust at $1.00...	41 97	0.0187
		$3,680 92	$1.649

Repairing.

Labor cleaning old blocks and relaying 2,310.098 sq. yds	$ 664 65	$0.287
298 4x4-inch blocks used at .06	17 88	0.0077
150.8 cu. yds. screened sand at .75	113 10	0.048
28.11 cu. yds. stone dust at $1.00	28 11	0.012
	$823 74	$0.354

Fulton avenue, between Fayette street and Patterson avenue:

Renewing.

	Total Cost.	Cost Per Square Yard.
Labor tearing out and laying 1,520.2945 sq. yds.	$ 321 99	$0.211
32,307 5x4-inch blocks used at .06½	2,099 96	1.381
100 cu. yds. screened sand at .75	75 00	0.049
31.1 cu. yds. stone dust at $1.00	31 10	0.021
	$2,528 05	$1.662

Repairing.

Labor cleaning old blocks and relaying 899 sq. yds	$342 19	$0.381
57.2 cu. yds. screened sand at .75	42 90	0.047
8.45 cu. yds. stone dust at $1.00	8.45	0.009
	$393 54	$0.437

Calhoun street, between Edmondson and Harlem avenues:

Renewing.

	Total Cost.	Cost Per Square Yard.
Labor tearing out and laying 574.724 sq. yds	$ 97 84	$0.170
14,760 4x4-inch blocks used at .06	885 60	1.540
10 cu. yds. screened sand at .75	7 50	0.0130
24.95 cu. yds. stone dust at $1.00	24 95	0.0434
	$1,015 89	$1.767

Repairing.

Labor cleaning old blocks and relaying 314.724 sq. yds	$116 25	$0.369
6 cu. yds. screened sand at .75	4 50	0.0143
32.26 cu. yds. stone dust at $1.00	32 26	0.102
	$153 01	$0.485

Lafayette avenue, between Fulton and Mt. Royal avenues:

Renewing.

	Total Cost.	Cost Per Square Yard.
Labor tearing out and laying 1104.78 sq. yds....	$ 189 00	$0.171
17,342 4x4-inch blocks used at .06	1,040 52	0.941
9,144 5x4-inch blocks used at .06½	594 36	0.537
2 cu. yds. screened sand at .75	1 50	0.0013
47.71 cu. yds. stone dust at $1.00	47 71	0.043
	$1,873 09	$1.695

Repairing.

Labor cleaning old blocks and relaying 987.11 sq. yds	272 12	0.275
264 5x4-inch blocks used at .06½.....	17 16	0.0174
10.5 cu. yds. screened sand at .75	7 88	0.0079
63.55 cu. yds. stone dust at $1.00.....	63 55	0.064
	$360 71	$0.365

Eutaw street and Eutaw Place, between Madison and North avenues:

Renewing.

	Total Cost.	Cost Per Square Yard.
Labor tearing out and laying 2,380.72 sq. yds ...	$ 447 79	$0.1880
46,257 5x4-inch blocks used at .06½	3,006 71	1.262
182 cu. yds. screened sand at .75	136 50	0.057
49.46 cu. yds. stone dust at $1.00	49 46	0.021
	$3,640 46	$1.528

Repairing.

Labor cleaning and relaying old blocks, 357.343 sq. yds	1,217 56	0.3405
310.9 cu. yds. screened sand at .75.....	233 18	0.065
27.43 cu. yds. stone dust at $1.00.....	27 43	0.0076
	$1,478 17	$0.413

Charles street, between Mount Vernon Place and Chase street:

Renewing.

	Total Cost.	Cost Per Square Yard.
Labor tearing out and laying 453.237 sq. yds....	$127 75	$0.282
4,515 5x4-inch new blocks used } 5,878 4x4-inch new blocks used }	600 76	1.325
52 cu. yds. screened sand at .75	39 00	0.086
6.69 cu. yds. stone dust at $1.00	6 69	0.015
	$774 20	$1.708

Repairing.

Labor cleaning old blocks and relaying 236.19 sq. yds	99 03	0.419
24.2 cu. yds. screened sand at .75.....	18 15	0.076
2.57 cu. yds. stone dust at $1.00.....	2 57	0.011
	$119 75	$0.506

St. Paul street, between Monument street and North avenue:

Renewing.

	Total Cost.	Cost Per Square Yard.
Labor tearing out and relaying 136.094 sq. yds.	$ 39 25	0.288
2,734 5x4-inch new blocks used at .06½.....	177 71	1.306
12 4x4-inch new blocks used at .06..... ...	72	0.005
16 cu. yds. screened sand at .75..... ...	12 00	0.088
1.09 cu. yds. stone dust at 1.25.....	1 36	0.010
	$231 04	1.697

Repairing.

Labor cleaning old blocks and relaying 591.248 sq. yds.....	$257 43	0.435
36 cu. yds. screened sand at .75.....	27 00	0.046
2.55 cu. yds. stone dust at 1.00....	2 55	0.004
	$286 98	0.485

St. Paul street and North avenue, remodeled to eliminate cross-cutter:

Labor tearing out and relaying 70.075 sq. yds..	$32 04	
88 4x4-inch blocks used at .06.....	5 28	
6 cu. yds. screened sand at .75.....	4 50	
	$41 82	0.5967

Mt. Royal avenue, intersection of Mosher street:

	Total Cost.	Cost Per Sq. Yd.
Labor	1 17	

McCulloh street, east of St. Mary street:

Repairing.

Labor tearing out and relaying 3.555 sq. yds.	2 83	
3 4x4-inch blocks used at .06	18	
0.25 cu. yds. screened sand at .75	19	
	$3 20	0.90

Pearl street, between Saratoga and Lexington streets:

Repairing.

Labor tearing out and relaying 4.44 sq. yds.	$2 30	
50 4x4-inch blocks used at .06	3 00	
0.5 cu. yds. screened sand at .75	38	
	$5 68	1.279

VITRIFIED BRICK REPAIRS.

Holliday street, between Fayette and Baltimore streets:

Labor	$2 96

Repairs made on west side of United Railways and Electric Company's tracks on Charles street between Read and Eager streets:

Labor, relaying 23.33 sq. yds.	$12 87
2 cu. yds. screened sand at $0.75	1 50
	$14 37

This amount was paid by the railway company.

COMPARATIVE COST OF ASPHALT BLOCK REPAIRS.

New Work.	1901.	1902.	Per Cent. Increase	Per Cent. Decrease
Square yards paved	5,675	8,401.518	48	.....
Expended for labor	$1,219.50	$ 1,618.27	$32\frac{7}{10}$	.....
Expended for material	9,524.05	12,125.38	$27\frac{3}{10}$	.....
Cost of labor per square yard	.21	.19	.....	$9\frac{5}{10}$
Cost of materials per square yard	1.67	1.44	.....	$13\frac{7}{10}$
Total cost per square yard	1.88	1.63	.....	$13\frac{3}{10}$
Old Work.				
Square yards repaved	4,816.7	8,913.717	85	.....
Expended for labor	1,799.94	2,965.48	$64\frac{8}{10}$	.....
Expended for material	264.70	650.42	$145\frac{7}{10}$	.....
Cost of labor per square yard	.373	.333	.....	11
Cost of materials per square yard	.055	.072	$23\frac{6}{10}$	.....
Total cost per square yard	.428	.40	.....	$5\frac{4}{10}$

REPAIRS TO SHEET ASPHALT PAVEMENTS.

The repairs to sheet asphalt pavements not under guarantee were made by the Filbert Paving and Construction Company under contract dated February 3d, 1902, and aggregated 2,142.9 square yards at a cost of $4,625.39.

A large patch containing 150.6 square yards, included in the 2,142.9 square yards, was put in on the old concrete on the east side of Broadway, north of Jefferson street, and is under guarantee for five years from May 17, 1902.

In many places the topping is badly rotted, but was not removed, as it was deemed economical to allow it to remain until next year's repairs, which will in consequence be much more extensive than were those of this year.

The following is a list of locations where repairs were made:

Location.	From.	To.	Area Sq, Yards.	Cost.	Guarantee.
Broadway	Canton avenue	North avenue	888.7	$1,884 28	1 year.
Broadway	Jefferson street	161 feet north	150.6	340 36	5 years.
Baltimore street	Broadway	Lakewood avenue	114.5	251 45	1 year.
Chase street	Gay street.	Calvert street	90.7	206 69	1 year.
Streets adjacent to Richmond Market			55.2	123 46	1 year.
Streets adjacent to Lafayette Market			79.2	163 88	1 year.
Calvert street	Read street	Mt. Royal avenue	98.4	214 50	1 year.
Plaza	Holliday street	Gay street	68.7	149 77	1 year.
Mulberry street	Charles street	Howard street	22.8	49 70	1 year.
Streets around City Hall			34.6	81 48	1 year.
Front street	Baltimore street	Gay street	136.0	296 48	1 year.
Center Market space			140.6	306 51	1 year.
Riddle Street Bridge			32.9	70 72	1 year.
St. Paul Street Bridge			27.9	66 84	1 year.
Streets adjacent to Hollins Market			65.4	142 67	1 year.
Cross Street Market			36.4	78 47	1 year.
Little Montgomery street			41.5	72 83	1 year.
Streets adjacent to Hanover Market			58.8	125 30	1 year.
			2,142.9	$4,625 39	

Charged to "Private Paving and Inspection"	$183 63	
Charged to "Repairs of Sewers"	35 38	
	$219 01	
Charged to "Repairs of Roads, Streets, etc."	4,406 38	
		$4,625 39

REPAIRS OF VITRIFED BRICK PAVEMENTS.

The brick pavement on Chase street, between the intersection of Maryland avenue and the west side of Charles street, was in such very bad condition that it was all torn out and renewed with new Canton blocks, and gutters laid with blocks 9x8x4 inches on both sides of the street from Maryland avenue to the west side of Morton street.

The street bed was filled in with screened sand and stone dust to the depth of from three to six inches to give it a proper crown.

For a short distance west from Charles street the sub-base of the old bricks was found to have been paved with ordinary bricks laid flat with a cushion of sand spread upon them. This was suffered to remain undisturbed.

The best of the old bricks were culled out and used in repairing the brick pavement on Biddle street between St. Paul street and Hargrove alley.

The vitrified bricks taken up on St. Paul street from the south side of Twenty-third street to Twenty-fourth street were all used in paving Lovegrove alley between Twenty-third and Twenty-fourth streets, while most of the cobble stones removed from the alley were used on St. Paul street as a sub-base for the sheet asphalt pavement.

Chase street, between Maryland avenue and Charles street:

Renewing.

	Total Cost.	Cost per Square foot.
Labor, tearing out old bricks and laying 1,648.59 sq. yds.	$ 355 97	0.216
68,562 new Canton blocks, at $24 per M.	1,645 49	1.010
430 new gutter blocks, at $48 per M.	20 64	
Hauling 68,562 Canton blocks, at $1.95 per M.	132 80	0.081
77.8 cubic yards screened sand, at 75c.	58 35	0.035
58.16 cubic yards stone dust, at $1	58 16	0.035
	$2,271 41	1.377

Altering Old Work.

Labor, cleaning old bricks and relaying 53.44 sq. yds.	$13 00	
2.31 cubic yards stone dust, at $1.	2 31	
	$15 31	0.286

Comparative Cost of Renewing Chase Street with Vitrified Blocks.

	1901.	1902.	Per Cent. Increase	Per Cent. Decrease
Square yards paved.	758.5	1,648.59	$117\frac{3}{10}$	.....
Expended for labor.	$ 187.50	$ 355.97	$89\frac{8}{10}$	.....
Expended for materials.	895.27	1,915.44	$113\frac{9}{10}$	.....
Cost of labor per square yard.	0.247	0 216	.....	$12\frac{5}{10}$
Cost of material per square yard.	1.180	1.161	.....	$1\frac{6}{10}$
Total cost per square yard.	1.427	1.377	.....	$3\frac{5}{10}$

The above comparison is only made with work done on Chase street last year.

Biddle street, between St. Paul street and Hargrove alley:

Repairing.

	Total Cost.	Cost Per Square Yard.
Labor, tearing out, cleaning and relaying 724.84 sq. yds.	$ 244 59	0.337
44 cubic yards screened sand at $0.75	33 00	0.045
12.64 cubic yards stone dust at 1.00 6.33 " " " " 1.25	20 55	0.028
	$ 298 14	0.411

Lovegrove alley, between Twenty-second and Twenty-third streets:

Replacing.

Labor, tearing out old cobble, cleaning and laying old bricks, 841.88 sq. yds	$ 381 42	0.453
94 cubic yards screened sand at $0.75	70 50	0.083
16.55 cubic yards stone dust at {.85 .90}	16 28	0.019
	$ 467 73	0.555

MOSAIC BLOCK PAVING.

Mosaic blocks were substituted for cobblestones in Block street, between Wills and Point streets, where the street was repaved from kerb to kerb and new gutterstones were laid on both sides for the full length of the block.

The old cobblestones from this street were used in repaving the adjacent cobblestone paved streets.

The old cobble pavement on Pratt street, from Central avenue to High street, was also torn up and replaced with new Mosaic blocks.

As there is a double tracked electric railroad in Pratt street, the area renewed was only that between the gutters and the outside rails.

All the six (6)-inch kerbstone on both sides of this street was reset and the gutterstone laid up against it, omitting the rebut and thereby adding a much needed space for wagons, between the kerbstones and tracks.

The old cobblestones were used in repairing adjacent streets.

A great deal of unnecessary delay and consequent expense to the city was caused by the failure of the contractor for this kind of material to deliver it in sufficient quantity to keep the work in continuous operation.

Though the specifications did not require it, the contractor of his own volition furnished between 40 and 50 per cent. of granite stone for this work, the balance being of gneiss.

The granite and gneiss blocks were kept separate and paved in areas to themselves.

It requires only an inspection of the two to see the superiority of the former over the latter.

The total area paved was 16,245 square feet, and the amount expended was:

For labor	$ 742 84	
For materials	1,186 63	
		$1,939 47
Credit 260 perches old cobblestones at $1.15 per perch		299 00
Total cost of blocks in place		$1,630 47
Cost per square foot for labor	$ 0.0457	
Cost per square foot for materials	0.0730	
		$ 0.1187
Credit per square foot for old cobblestones		0.0184
Total cost per square foot completed		$ 0.1003

The cost of labor includes the cost of taking up and hauling out old material, preparing bed, hauling in new material and laying same.

That for materials includes the cost of blocks and sand.

REPAIRS OF GRANOLITHIC GUTTERS.

The plan begun in 1901, in the repairing of this kind of gutter was continued the past year, and in many places the stretch of vitrified brick gutter laid in 1901, was further extended by the displacement of the granolithic one which had, in the interval, become disintegrated.

No repairs were necessary to any of the stretches of vitrified brick gutters laid last year.

The brands of cement used were Alpha, American, and Germania, foreign Portland, the former as a sub-base and the latter as a top coating.

Total amount expended for labor	$300 19	
Total amount expended for materials	184 77	
		$484 96

The following is a list of streets on which repairs were made, showing the amount expended for labor and material on each;

Baltimore street from Broadway to Patterson Park avenue:

48.25 lineal feet patchwork.

Amount expended for labor	$5 50	
Amount expended for material	2 10	
		$7 60

Little Montgomery street from Leadenhall street to Sharp street:

8 6 lineal feet patchwork.

Amount expended for labor	$2 50	
Amount expended for material	82	
		$3 32

Richmond Market:

4.25 lineal feet new gutter.

45.4 lineal feet patchwork.

Amount expended for labor	$8 00	
Amount expended for material	2 09	
		$10 09

Chase street from Broadway to Barclay street:

9 lineal feet new work.

11.9 lineal feet patchwork.

Amount expended for labor	$5 50	
Amount expended for material	4 25	
		$9 75

Mulberry street from Charles street to Howard street:

14 lineal feet new work.

Amount expended for labor	$3 00	
Amount expended for material	1 89	
		$4 89

St. Paul street from Eager street to Chase street:

12 lineal feet new work.

49 lineal feet patchwork.

Amount expended for labor	$11 00	
Amount expended for material	3 52	
		$14 52

Broadway from Eastern avenue to Preston street:

59.4 lineal feet new work.

78.4 lineal feet patchwork.

Amount expended for labor	$36 00	
Amount expended for material	17 25	
		$53 25

Fayette street from Calvert street to North street:

17 lineal feet patchwork.

Amount expended for labor	$1 73	
Amount expended for material	40	
		$2 13

Calvert street from Read street to Eager street:

7 lineal feet patchwork.

Amount expended for labor	$2 29	
Amount expended for material	2 22	
		$4 51

Holliday street from Fayette street to Lexington street:

20 lineal feet vitrified brick gutter.
3 lineal feet cement gutter patchwork.

Amount expended for labor	$8 60	
Amount expended for material	2 62	
		$11 22

Lexington street from Arch street to Stockton street:

33 lineal feet vitrified brick gutter.
7 lineal feet cement gutter patchwork.

Amount expended for labor	$14 89	
Amount expended for material	10 77	
		$25 66

Saratoga street from Cathedral street to Fremont avenue:

676 lineal feet vitrified brick gutters.
467 lineal feet new cement gutters.
143 lineal feet cement gutter patchwork.
80 square feet Belgian block repaving.
799 square feet asphalt block repairs.

Amount expended for labor	$201 18	
Amount expended for material	136 84	
		$338 02

The cost of the combination vitrified brick and cement gutters is approximately the same per lineal foot as in 1901.

MAINTENANCE OF BRIDGES AND CULVERTS.

Spreading stone over Dead Run bridge:

Expended for labor	$8 17

REPAIRS TO IRON-COVERED GUTTERS.

Location.	Expended.		
	Labor.	Material.	Total.
Pratt street and Cheapside	$ 5 25	.....	$ 5 25
Pratt and Bowly streets	1 17	.....	1 17
Caroline street and Eastern avenue	42	.....	42
Caroline and Aliceanna streets	30 96	$9 52	40 48
Canton avenue and President street	1 62	.....	1 62
Caroline and Lombard streets	7 00	.....	7 00
Caroline and Lancaster streets	2 17	.....	2 17
President and Stiles streets	14 32	1 13	15 45
Caroline and Baltimore streets	1 50	.....	1 50
Caroline street and Canton avenue	3 00	3 36	6 36
Albemarle and Stiles streets	1 05	.....	1 05
Charles and Cross streets	10 99	3 59	14 58
Liberty and Lexington streets	3 34	.....	3 34
Eutaw and Pratt streets	3 34	.....	3 34
St. Paul and Centre streets	1 58	.....	1 58
Baltimore and Ann streets	3 17	62	3 79

NEWLY-COVERED GUTTER.

Location.	Expended.		
	Labor.	Material.	Total.
Central avenue and Stiles street	$10 67	$8 87	$19 54

GUTTERS CHANGED FROM SIDES TO CENTRE.

The following are the small residential streets and alleys in which side gutters were removed and one of standard gutterstone in the centre constructed:

Street or Alley.	Location.
Allen alley	Between Central avenue and Exeter street.
Spring street	Between Pratt street and 100 feet north of Gough street.
Spring street	Between Monument and McElderry streets.
Spring street	Between Madison street and Ashland avenue.
Duncan alley	Between Lombard and Baltimore streets.
Madeira street	Between Fayette and Orleans streets.
Chapel street	Between Lombard and Pratt streets.
Chapel street	Between Eager street and Ashland avenue.
Dock street	Between Caroline and Dallas street.
Dallas street	Between Townsend street and 150 feet south of North avenue.
Hulls' lane	Between Forrest and Aisquith streets.
Peach alley	Between West and Cross streets.
Morton street	Between Centre and Hamilton streets.
Moore street	Between Tessier street and Druid Hill avenue.
Cider alley	Between Penn and Greene streets.
Marion street	Between Howard and Eutaw street.

CROSS GUTTERS.

The following open cross gutters in street intersections were considered superfluous, and therefore removed:

From Across.	At.
Rogers avenue	Northwest side of Gay street.
Mott street	Northwest side of Gay street.
Eden street	North side of Monument street.
Gough street	South side of Pratt street.
East side Jackson Square	South side of Fayette street.
20 feet north of Cable st.	Bowley street.
Edmondson avenue	East side of Brune street.
George street	East side of Brune street.
St. Paul street	South side of North avenue.

NEW WORK.

Under this heading several pieces of work were done, not properly chargeable to the account of "Repairs to Roads, Streets, etc."

St. Paul street, at Hamilton street, was widened and the six-inch kerb set to the new line.

The arrangement of the gutters and cross gutters was also changed, improving very much the former condition at this point.

Before the change the entire street was one mass of frozen filth after every cold snap; since then there has been no inconvenience experienced whatever.

The new arrangement of gutters seems to keep the street clean even in freezing weather.

The character and amount of work done include 218 lineal feet of new and old gutter, 328 lineal feet of six-inch kerb reset, 351 square feet of flagstone relaid, and 935 square yards of Belgian blocks paved.

Expended for labor	$273 30
Expended for materials	215 72
Total	$489 02

IMPROVEMENT AT HILLEN STATION.

At the request of the Western Maryland Railroad Company, the grades were lowered between the kerb line and its freight sheds along Exeter and High streets, between Hillen and Front streets, and then repaved with Belgian blocks by this Department.

The expense of this work was defrayed by the company, and is as follows, viz:

Expended for labor	$1,106 47
Expended for materials	536 05
Total	$1,642 52

This does not include the cost of the Belgian blocks, which the company bought and paid for direct.

The total amount of work done was 820.6 square yards of Belgian block paving, 951.2 lineal feet of gutter stone, and 262 square feet of cobble stone.

INTERSECTION OF NORTH AVENUE AND M'MECHEN STREET.

This improvement consisted in cutting off about twenty-eight feet of the sidewalk at the southwest side of North avenue intersecting McMechin street, and setting fifty feet seven and one-half inches of new six-inch circular granite kerb, cut to a radius of twenty feet.

The double row of flagstone crossing was then continued to the new kerb line, the necessary grading and filling done to shape up the newly acquired area, which was paved with new Belgian blocks, and a portion of the old block pavement readjusted to meet the grade of the new work.

In addition to the tearing out of the old kerb, there were 381.77 square yards of Belgian blocks laid, of which 69.5 square yards were new pavement and 172 square feet of flagstone set.

The cost is as follows:

For labor	$175 63
For 1,785 new Belgian blocks at $45.00 per M	80 33
For hauling same	6 00
For 12 cu. yds. sand at 55c	6 60
For 50 ft. 7½-inch circular 6-in. kerb at $1.60	81 00
For hauling 84 ft. of 6-in. old kerb to property yard	7 68
For hauling flagstones from St. Paul street	7 50
For hauling old material to property yard	2 00
Total	$366 74

FORT AVENUE EASTERLY FROM LIGHT STREET.

New Belgian blocks were laid in Fort avenue about sixty-five (65) feet easterly from the intersection of Light street in place of an area of 132 square yards of old cobblestone pavement left there when Fort avenue was paved with Belgian blocks.

The gutterstones were reset, thirty-eight (38) feet of old 4½-inch kerbstone were taken out and replaced with an equal length of old 6-inch kerbstone from the property yard, and new flagstones were laid across Fort avenue at the east side of Light street.

Expended for labor	$104 67
Expended for materials	168 67
Total	$273 34

SOUTH SIDE OF TWENTY-FIRST STREET WESTERLY FROM MARYLAND AVENUE.

New kerb and gutterstones were set on the south side of Twenty-first street westerly from Maryland avenue to the 10-foot alley at the east side of No. 18 Engine House, and an area of 2,500 square feet of macadam road, on this side of the street, was torn up and replaced with new cobblestones.

Expended for labor	$130 61
Expended for materials	177 26
Total	$307 87

CASTLE STREET.

Seventy-five feet of new 4½-inch kerbstone and an equal length of new hammer-dressed gutterstone were set on the west side of Castle street, between Lanvale street and Lafayette avenue, and an unpaved area of 1,000 square feet of the street bed was paved with new cobblestones.

The cost of this work, which was $135.00, was paid by the abutting property holder.

RIGGS AVENUE.

The unpaved area on the south side of Riggs avenue, westerly from Calhoun street for a distance of about 100 lineal feet, and left in that condition from the time Riggs avenue was widened and paved easterly to Arlington avenue, was graded, kerbed and paved.

The total new area paved with cobblestones was 565.5 square yards, the cost of which was charged to the appropriation for "Repairs of Roads, Streets, etc."

Widening North avenue and changing gutters at Peck's Branch.

Appropriation		$5,460 00
Expended (contract)	$3,093 56	
Expended for day's labor and for materials	773 27	
		3,866 83
Unexpended		$1,593 17

Under "The Ordinance of Estimates" for the year 1902 there was appropriated the sum of $5,460 for the widening of North avenue and changing gutters at Peck's run, which is between Slingluff avenue and a point a short distance east of Fifth street.

Under date of May 5, 1902, a contract was made with Patrick Keelty to do the necessary grading and filling at thirty-four (34 cts.) cents per cubic yard.

It required 9,098 7-10 cubic yards of earth to make the fill. The character of the material used in the fill was first-class, being mostly fine rotton rock.

The gutter easterly and westerly from Peck's run on the south side of the avenue, between Slingluff avenue and Fifth street, and the one on the north side, between Peck's run and Slingluff avenue, are constructed of new standard gutter-stone.

The changing of the old paved gutters was retarded by the inclemency of the weather, but will be completed as soon as the weather permits.

Of the amount, $793.27, expended by day's labor and for materials, $706.25 were expended by this branch of the departments, $495.77 of which was for labor and $210.48 for material.

GRADING AND KERBING OF CALVERT AND TWENTY-NINTH STREETS.

Upon the completion by the contractor of the grading and filling of Calvert street between Twenty-fifth and Twenty-eighth streets, and Twenty-ninth street between Maryland avenue and St. Paul street, a contract was made with Daniel N. Sullivan to set the new 4½-inch regulation kerb on both streets at ten (10) cents per lineal foot.

Owing to the lateness of the season and the inclemency of the weather, it was deemed advisable to suspend operations until spring, in consequence of which only a small amount of kerb was set.

Most of the kerb for Calvert street is on the ground.

Expended for 1,200 lineal feet straight kerb.....	$ 660 00
Outstanding requisitions for 2,441 lineal feet straight kerb, and outstanding requisitions for 61.23 lineal feet circular kerb...	1,410 18
	$ 2,070 18

NEW FOOTWAY CROSSINGS OF VITRIFIED CANTON BLOCKS.

It will be noted by reference to the list of footway crossings of this kind of material that they were laid in all sections of the City, the business one excepted.

In addition to the tearing out of the cobble stone pavement and laying of the vitrified bricks, a considerable amount of cobble stone repairing and some kerb resetting was done, which are included in the cost per square yard of footway pavement laid.

The following table shows the comparative cost of laying these crossings:

COMPARATIVE COST OF VITRIFIED BRICK FOOTWAY CROSSINGS.

	1901.	1902.	Per Cent.	
			Increase	Decrease
Square yards paved	1,514.4	2,329.1	$53\frac{8}{10}$	.....
Expended for labor	$1,197.44	$1,498.96	$25\frac{1}{10}$	.....
Expended for materials	1,593.56	2,510.00	$57\frac{5}{10}$	.....
Cost of labor per square yard	.79	.64	.....	19
Cost of materials per square yard	1.05	1.08	$2\frac{8}{10}$	.....
Total cost per square yard	1.84	1.72	.....	$6\frac{5}{10}$

STATEMENT OF EXPENDITURES ON ACCOUNT OF FOOTWAY CROSSINGS.

Appropriation	$4,000 00	
Vitrified bricks on hand from 1901	264 00	
Materials purchased 1902		$2,325 25
Hauling 1902		185 87
Inspection		44 99
Labor		1,498 96
Outstanding requisition		86 66
Bricks on hand		122 27
	$4,264 00	$4,264 00

Location.			Square feet Vitrified Brick.	Square feet Cobble-stone.	Cost.		
Side.	Streets, Etc.	Across.			Labor.	Material.	Total,
North	Ashland avenue.....	Stirling street.....	120	198	$ 15 50	$ 14 74	$ 30 24
North	Lombard street	Exeter street	109	181	7 00	12 72	19 72
East	Exeter street.....	Lombard street	122	201	8 50	14 00	22 50
West	Holliday street.....	Bath street.....	124	139	9 05	15 82	24 87
East	Holliday street.....	Bath street.....	142	160	10 33	17 63	27 96
	At Free Bath	High street.....	146	195	11 62	17 69	29 31
West	Oak street	Twenty-first street	141	74	5 42	17 80	23 22
East	Chester street	Oliver street.....	200	184	15 50	25 56	41 06
South	Oliver street	Chester street.....	211	330	15 67	26 42	42 09
East	Chester street	Keyser street	120	96	7 83	14 43	22 26
West	Chester street	Keyser street	120	96	7 84	14 46	22 30
West	Chester street	Bokee street.....	120	105	8 21	14 10	22 31
East	Washington street...	Keyser street	120	120	11 71	14 99	26 70
East	Washington street...	Alley south of Federal st	74	95	3 95	9 16	13 11
East	Washington street...	Lanvale street.....	182	315	15 67	22 36	38 03
North	Lanvale street	Washington street	214	175	11 70	22 86	34 56
West	Forrest street	Biddle street	198	304	15 67	24 41	40 08
North	Preston street	Alley west of Homewood avenue	74	120	5 21	9 49	14 70
South	Hoffman street.....	Alley west of Homewood avenue	53	62	3 75	5 76	9 51
South	Hoffman street.....	Alley west of Homewood avenue	98	90	6 79	12 62	19 41
South	Hoffman street.....	Wilcox street.....	120	168	6 59	15 04	21 63

Location.			Square feet Vitrified Brick.	Square feet Cobble-stone.	Cost.		
Side.	Streets, Etc.	Across.			Labor.	Material.	Total.
South	Hoffman street.....	Wirt street	88	105	9 17	10 88	20 05
West	Ensor street	Hoffman street	199	273	16 17	23 57	39 74
East	Barclay street.....	Alley west of Lafayette avenue	50	60	3 33	6 34	9 67
South	Hoffman street.....	Holbrook street.....	60	72	4 58	7 35	11 93
South	Hoffman street	Alley west of Ensor st .	50	60	3 33	6 64	9 97
North	Lafayette avenue....	Sherman place	60	84	4 58	7 81	12 39
North	Lanvale street	Sherman place	60	75	6 29	7 04	13 33
South	Lafayette avenue ...	Latrobe street	60	72	4 37	6 87	11 24
North	Lafayette avenue....	Alley E. of Guilford ave.	50	80	5 01	6 04	11 05
East	Barclay street.....	Alley S. of Lafayette ave.	42	70	3 87	5 66	9 53
North	Lanvale street	Alley east of Barclay st.	40	50	3 87	5 16	9 03
South	Lanvale street	Sherman place	61	90	7 92	7 63	15 55
East	Wolfe street.....	Ashland avenue	189	.....	7 42	23 23	30 65
South	Ashland avenue.....	Wolfe street.....	181	139	8 33	21 88	30 21
West	Hopkins avenue	Madison street.....	195	185	7 83	23 59	31 42
West	Wolfe street.....	Alley north of Eager st.	50	75	3 96	6 53	10 49
West	Hopkins avenue	Monument street	185	285	15 66	22 29	37 95
East	Hopkins avenue	Monument street	185	235	11 30	21 84	33 14
East	Wolfe street.....	Monument street	173	197	12 30	18 92	31 22
South	Orleans street.....	Durham street.....	58	60	3 87	8 09	11 96
East	Collington avenue...	Orleans street	106	203	12 13	23 19	35 32
South	Fairmount avenue ..	Chapel street	60	96	7 83	7 75	15 58
South	Fairmount avenue ..	Madeira street.....	100	140	7 83	12 31	20 14
South	McElderry street	Patterson Park avenue.	204	310	15 67	24 56	40 23

North	Canton avenue	Wolfe street	139	166	11 80	14 98	26 78
East	Cannon street	Fait avenue	210	275	15 67	24 31	39 98
South	Fait avenue	Cannon street	210	268	13 83	24 31	38 14
North	Hudson street	Luzerne street	196	171	12 42	24 00	36 42
West	Luzerne street	Fait avenue	208	245	11 30	24 26	35 56
South	Fait avenue	Lakewood avenue	211	195	7 70	25 03	32 73
South	Eastern avenue	Streeper street	120	216	11 08	14 18	25 26
West	Patterson Park ave.	Alley S. of Eastern ave.	50	70	4 58	6 68	11 26
North	Eastern avenue	Castle street	60	58	3 45	7 15	10 60
West	Ann street	Alley S. of Baltimore st.	50	70	3 45	6 55	10 00
South	Bank street	Central avenue	110	125	8 75	12 97	21 72
North	Bank street	Central avenue	110	110	8 05	12 96	21 01
West	Exeter street	Trinity street	149	165	7 62	17 73	25 35
West	Fawn street	Alley east of Exeter st.	51	45	3 87	6 27	10 14
West	Washington street	Alley south of Pratt st.	57	85	5 55	6 90	12 45
South	Bank street	Castle street	59	66	3 96	6 80	10 76
East	Patterson Park ave.	Alley N. of Baltimore st.	52	90	6 17	6 42	12 59
West	Washington street	Alley N. of Eastern ave.	50	125	7 62	6 17	13 79
West	Canton avenue	Collington avenue	156	224	17 62	19 03	36 65
North	Gough street	Herring court	144	90	10 42	8 82	19 24
South	Cross street	Battery avenue	165	150	8 00	20 77	28 77
North	Cross street	William street	150	145	7 82	18 07	25 89
South	William street	West street	150	210	10 45	20 30	30 75
South	West street	Durst alley	57	60	4 38	7 12	11 50
East	Battery avenue	West street	150	150	8 75	17 83	26 58
East	Riverside avenue	Folsom avenue	108	.....	3 45	13 67	17 12
North	West street	Hall alley	53	45	3 47	6 04	9 51
East	Henry street	Alley north of Fort ave.	50	45	3 21	5 50	8 71
West	Henry street	Alley north of Fort ave.	64	70	3 98	7 40	11 38
North	Jackson street	Harvey street	150	75	6 31	19 07	25 38
East	Jackson street	Alley west of Fort ave.	60	.....	1 17	7 25	8 42
West	Jackson street	Clement street	196	234	12 70	24 21	36 91
North	West street	James alley	60	75	3 88	7 02	10 90
North	Beverly street	Patapsco street	151	180	9 50	18 00	27 50
East	Cross street	Plum alley	60	72	6 67	7 80	14 47

Location.			Square feet Vitrified Brick.	Square feet Cobble-stone.	Cost.		
Side.	Streets, Etc.	Across.			Labor.	Material.	Total.
East	Hamburg street.....	James alley.....	45	50	$ 3 93	$ 5 29	$ 9 22
West	Cross street.....	Plum alley.....	60	72	5 18	7 64	12 82
East	Allen street.....	Alley north of Fort ave.	75	60	2 83	9 06	11 89
West	Allen street.....	Alley north of Fort ave.	75	135	7 41	9 07	16 48
North	Fort avenue.....	Ludlow street.....	190	150	8 50	22 88	31 38
South	Fort avenue.....	Ludlow street.....	195	350	15 66	24 61	40 27
East	Henry street.....	Alley south of Fort ave.	50	50	4 29	6 07	10 36
North	Fort avenue.....	Stevenson street.....	117	245	11 37	14 63	26 00
West	Riverside avenue....	Wehage street.....	55	88	5 33	7 33	12 66
West	Henry street.....	Alley south of Fort ave.	49	55	3 95	5 88	9 83
East	Henry street.....	Alley south of Fort ave.	75	85	4 71	8 95	13 66
North	Fort avenue.....	Alley east of Charles st.	50	50	5 21	5 86	11 07
West	Riverside avenue....	Alley south of Fort ave.	45	60	3 55	5 47	9 02
South	Fort avenue.....	Alley east of Charles st.	51	55	5 58	5 86	11 44
South	Fort avenue.....	Patapsco street.....	150	285	12 71	17 93	30 64
West	Marshall avenue....	Randall street.....	117	.....	2 96	14 36	17 32
West	Charles street.....	Cross street.....	95	90	7 38	10 43	17 81
East	Charles street.....	Clement street.....	50	45	2 72	5 87	8 59
East	Charles street.....	Ropewalk lane.....	52	50	3 96	5 95	9 91
East	Charles street.....	Heath street.....	150	120	7 83	18 61	26 44
West	Charles street.....	Heath street.....	150	135	7 83	18 08	25 91
East	Hanover street.....	McComas street.....	200	280	13 70	23 54	37 24
East	Hanover street.....	Winder street.....	200	320	12 50	21 44	33 94
West	Race street.....	Alley S. of Roseland st.	50	45	4 38	6 06	10 44
East	Charles street.....	Creek alley.....	58	60	4 38	7 45	11 83

South	Race street	Roseland street	100	120	6 92	12 03	18 95
West	Charles street	Welcome alley	65	75	4 38	8 69	13 07
East	Charles street	Welcome alley	60	50	4 17	7 39	11 56
West	Charles street	Creek alley	60	50	2 05	6 20	8 25
East	Light street	Clement street	50	65	3 88	3 67	7 55
East	Charles street	Hughes street	60	60	3 96	7 18	11 14
East	Leadenhall street	Henrietta street	195	390	16 01	21 59	37 60
West	Charles street	Guilford alley	50	60	3 96	5 43	9 39
West	Charles street	Hughes street	60	72	3 96	7 09	11 05
East	Fremont avenue	Wayne street	57	50	3 46	6 49	9 95
West	Eutaw street	Perry street	58	65	3 96	6 31	10 27
East	Paca street	German street	170	216	11 63	21 46	33 09
South	German street	Paca street	245	237	15 66	27 85	43 51
West	Fremont street	Burgundy alley	80	102	7 92	10 96	18 88
North	Ramsay street	Norris alley	61	55	4 38	7 23	11 61
South	McHenry street	Norris alley	61	60	3 47	7 03	10 50
South	Ramsay street	Stricker street	189	222	10 13	23 11	33 24
East	Gilmor street	Ramsay street	195	224	10 55	22 92	33 47
North	Ramsay street	Pulaski street	212	175	11 80	25 24	37 04
South	McHenry street	Alley east of Payson st.	50	72	4 38	5 87	10 25
South	McHenry street	Alley west of Monroe st.	50	65	4 38	5 87	10 25
East	Pulaski street	Christian street	120	145	6 92	14 21	21 13
North	McHenry street	Monroe street	193	195	10 92	22 61	33 53
South	McHenry street	Goldsmith alley	60	96	4 80	7 03	11 83
West	Pulaski street	Wilhelm street	117	138	7 84	13 86	21 70
East	Pulaski street	Wilhelm street	120	115	7 84	14 26	22 10
North	Lombard street	Mount street	196	238	12 43	23 56	35 99
South	Mount street	Hollins street	194	342	14 92	22 82	37 74
West	Payson street	Hollins street	195	234	13 21	22 87	36 08
East	Payson street	Baltimore street	115	190	8 25	13 20	21 45
West	Payson street	Baltimore street	119	220	10 12	13 22	23 34
West	Pulaski street	Baltimore street	115	140	7 84	14 04	21 88
East	Pulaski street	Baltimore street	115	136	7 83	13 45	21 28
South	Fayette street	Bruce street	60	78	3 87	7 01	10 88

Location.			Square feet Vitrified Brick.	Square feet Cobble-stone.	Cost.		
Side.	Streets, Etc.	Across.			Labor.	Material.	Total.
East	Mount street.....	Alley S. of Lexington st.	50	72	$ 3 88	$ 7 32	$11 20
West	Monroe street.....	Baltimore street.....	115	138	7 92	13 12	21 04
North	Saratoga street.....	Kirby lane.....	58	60	3 96	6 83	10 79
South	Saratoga street.....	East of Bruce street.. .	56	55	3 88	6 60	10 48
West	Mount street.....	Alley N. of Lexington st	50	60	3 92	6 16	10 08
East	Mount street.....	Alley N. of Lexington st	50	60	3 91	6 17	10 08
South	Mulberry street	Alley east of Fulton ave	71	60	4 38	8 26	12 64
South	Mulberry street	Alley west of Mount st.	48	55	3 45	5 78	9 23
South	Mulberry street	Vincent street.....	64	50	3 95	7 65	11 60
West	Gilmor street.....	Alley south of Fayette st	50	55	3 87	5 96	9 83
East	Monroe street.....	Alley south of Edmondson avenue.....	51	60	3 45	6 14	9 59
East	Monroe street.....	Pierce street.....	61	60	3 88	6 70	10 67
North	Saratoga street.....	Alley east of Carey street	50	75	4 17	5 95	10 12
North	Saratoga street.....	Alley west of Carey street	50	75	4 17	5 97	10 14
West	Brune street	Bradley street	61	72	3 45	7 26	10 71
East	Fremont avenue	Pierce street.....	95	100	8 77	11 11	20 18
East	Fremont avenue	Bradley street.....	63	89	3 45	7 29	10 74
North	Mulberry street	Ogston street	75	90	6 27	8 89	15 16
East	Brune street.....	Bradley street.....	57	60	3 45	6 82	10 27
South	Winchester street....	Gilmor street	115	105	7 42	13 51	20 93
East	Monroe street.....	Alley N. of Harlem ave.	50	70	4 17	6 03	10 20
East	Monroe street.....	Oakley street.....	148	175	10 02	17 50	27 52
South	Lorman street.....	Vincent street.....	61	50	3 87	7 10	10 97
North	Lorman street.....	Vincent street.....	60	50	3 87	7 01	10 88

North	Lorman street.....	Alley west of Mount st.	48	40	2 92	5 61	8 53
North	Lorman street.....	Alley east of Mount st.	53	50	3 45	6 22	9 67
North	Lorman street.....	Alley west of Gilmor st.	51	45	2 05	5 48	7 53
South	Lorman street.....	Bruce street.....	60	90	4 78	7 02	11 80
North	Lorman street.....	Bruce street..	60	90	3 86	6 59	10 45
South	Lorman street.....	Alley west of Mount st.	49	65	2 67	5 80	8 47
North	Presstman street....	Vincent street.....	60	90	4 78	7 02	11 80
South	Presstman street....	Vincent street.....	60	85	4 92	7 02	11 94
South	Presstman street....	Alley west of Mount st.	50	75	3 57	5 97	9 54
South	Presstman street....	Bruce street.....	60	85	4 92	7 03	11 95
West	Carey street.....	Alley N. of Lafayette ave	47	60	2 74	5 56	8 30
East	Carey street.....	Alley N. of Lafayette ave	50	60	3 45	5 99	9 44
East	Calhoun street	Alley S. of Lafayette ave	50	60	3 45	5 99	9 44
West	Calhoun street.....	Alley S. of Lafayette ave	43	50	2 50	5 25	7 75
West	Stricker street.....	Alley S. of Lafayette ave	75	75	6 26	8 89	15 15
West	Stricker street.....	Alley N. of Lanvale st..	50	80	3 97	5 84	9 81
South	Mosher street.....	Alley west of Stricker st.	48	70	3 04	5 64	8 68
West	Mount street.....	Alley south of Baker st.	45	60	2 17	5 43	7 60
East	Mount street.....	Alley south of Baker st.	53	95	6 91	6 29	13 20
North	Baker street.....	Alley east of Gilmor st .	48	70	3 46	5 72	9 18
South	Baker street.....	Alley S. of Stricker st...	52	95	3 87	6 17	10 04
West	Carey street.....	Presstman street.....	193	200	12 29	21 71	34 00
South	Presstman street.....	Parrish street.....	91	108	12 22	10 90	23 12
South	Pennsylvania avenue.	Fremont avenue.....	203	185	12 17	24 35	36 52
South	Bloom street.....	Alley west of Druid Hill avenue.....	54	60	3 92	6 63	10 55
North	Bloom street.....	Alley west of Druid Hill avenue.....	50	60	3 46	6 04	9 50
North	Gold street.....	Alley west of Druid Hill avenue	48	50	3 92	5 78	9 70
South	Gold street....	Alley west of Druid Hill avenue..... ...	48	60	3 88	5 70	9 58
North	Robert street.....	Alley west of Druid Hill avenue.....	50	70	4 17	5 96	10 13
South	Robert street.....	Alley west of Division st	47	45	3 70	5 49	9 19

Location.			Square feet Vitrified Brick.	Square feet Cobble-stone.	Cost.		
Side.	Streets, Etc.	Across.			Labor.	Material.	Total.
South	Robert street.....	Alley east of Penn. ave.	55	85	4 34	6 76	11 10
South	Wilson street.....	Alley east of Division st.	48	50	3 64	6 20	9 84
West	Division street.....	Alley S. of Laurens st...	44	50	3 60	5 56	9 16
West	Division street.....	Alley N. of Laurens st..	53	80	4 75	7 00	11 75
South	McMechin street	Brunt street.....	60	105	5 10	7 38	12 48
South	Wilson street.....	Brunt street.....	60	104	5 64	7 43	13 07
South	Wilson street.....	Etting street.....	61	106	5 60	7 36	12 96
North	Lanvale street.....	Wilmer alley.....	53	42	3 68	6 68	10 36
South	Lanvale street.....	Alley W. Druid Hill ave	42	40	3 25	5 16	8 41
South	Lanvale street.....	McCulloh alley.....	60	50	3 95	7 13	11 08
South	Lanvale street.....	Jordan alley.....	87	43	5 20	10 37	15 57
East	Park avenue.....	Alley N. of Dolphin st..	50	55	4 07	6 04	10 11
West	Park avenue.....	Alley N. of Dolphin st..	46	51	3 31	5 65	8 96
West	John street.....	Alley N. of Dolphin st..	50	50	4 06	6 04	10 10
West	John street.....	Alley S. of Lanvale st..	44	48	2 97	5 18	8 15
West	John street.....	Alley N. of Lanvale st..	61	90	5 42	7 38	12 80
East	John street.....	Alley N. of Lanvale st..	54	70	3 88	6 50	10 38
West	John street.....	Alley N. of Lafayette ave	38	51	2 91	4 53	7 44
South	Mosher street.....	Alley west of John st ..	51	65	3 87	6 24	10 11
South	Preston street.....	Jordan alley.....	58	70	7 00	7 77	14 77
North	Preston street.....	Jordan alley.....	59	65	5 53	7 35	12 88
North	Mosher street.....	Alley west of John st..	50	60	3 63	6 06	9 69
South	Chase street.....	Fulton street.....	69	90	7 31	8 39	15 70
West	Maryland avenue ...	Alley N. of Mt. Royal ave	36	52	2 50	4 38	6 83
North	Oliver street.....	Morton alley.....	55	65	6 27	6 63	12 90
West	Park avenue.....	Lanvale street.....	196	210	13 59	24 82	38 41
North	North avenue.....	Druid Hill avenue	272	382	27 96	33 70	61 66
East	Oak street.....	Alley north of North ave	40	.....	5 70	.....	5 70
East	Oak street..	Alley south of 20th st..	19	.....	2 80	.....	2 80
			20,962	23,739	$1,498 96	$2,510 00	$4,008 96

FOOTWAY CROSSINGS OF OLD VITRIFIED BRICKS.

Location.	Labor.	Material.	Total cost.
Across Boone street, south side 20th street	$28 33	$2 00	$30 33
Square feet of vitrified brick..... 187			
" " " cobblestone..... 220			
Across Cromwell street, south side 20th st.	18 92	1 11	20 03
Square feet of vitrified brick..... 182			
" " " cobblestone..... 144			

OLD FLAGSTONES TAKEN FROM IMPROVED STREETS WERE LAID AS BELOW.

Side.	Streets, Etc.	Across.	Square Feet.		Lineal Feet.		Cost.		
			Flag.	Cobble.	Gutter.	Kerb.	Labor.	Material.	Total.
West	Calvert street	Twenty-fourth street	160	200	12	.....	$ 19 00	$ 7 60	$ 26 60
South	Twenty-fifth st...	Belmont avenue	175	200	7	.....	16 08	7 10	23 18
South	Federal street....	Holbrook street.....	175	210	.....	.....	17 42	4 80	22 22
North	Federal street....	Holbrook street.....	175	210	.....	.....	17 42	4 80	22 22
East	Ensor street	Federal street	150	180	.....	.....	10 50	6 60	17 10
North	Federal street	Bethel street	64	65	.....	.....	9 00	2 20	11 20
North	Lanvale street ...	Alley west of Dallas street...	60	97	.....	.....	6 08	2 30	8 38
South	Lanvale street ...	Alley west of Dallas street...	60	97	.....	.....	6 08	2 30	8 38
North	Lanvale street ...	Alley east of Dallas street ...	40	65	5	.....	7 33	2 30	9 63
South	Lanvale street ...	Alley east of Dallas street ...	40	65	.....	.....	6 50	2 30	8 80
North	Lanvale street ...	Bethel street.....	70	104	.....	.....	6 09	4 75	10 84
South	Lanvale street ...	Bethel street.....	70	103	.....	.....	6 09	4 75	10 84
North	Townsend street..	Spring street.....	48	55	.....	.....	7 41	2 95	10 36
South	Townsend street..	Spring street.....	48	55	.....	.....	7 42	2 95	10 37
North	Townsend street..	Alley west of Dallas street...	40	25	5	.....	4 20	2 80	7 00
North	Townsend street..	Dallas street.....	52	13	5	.....	4 21	5 10	9 31
North	Townsend street..	Alley east of Dallas street ...	40	25	5	.....	4 21	2 30	6 51
South	Townsend street..	Alley east of Dallas street ...	40	27	5	.....	4 21	2 30	6 51
East	Hopkins avenue .	Alley north of Oliver street..	47	86	7	.....	5 71	2 30	8 01
West	Hopkins avenue .	Alley north of Oliver street..	48	85	7	.....	5 71	2 30	8 01
West	Hopkins avenue .	Crystal avenue.....	70	117	.....	5	7 17	4 10	11 27
West	Hopkins avenue .	Alley south of Federal street.	50	83	.....	.....	5 00	2 30	7 30
East	Hopkins avenue .	Alley south of Federal street.	50	70	4	.....	4 05	2 30	6 35
East	Hopkins avenue .	Alley north of Federal street.	50	70	4	.....	4 06	2 30	6 36
West	Hopkins avenue .	Alley north of Federal street.	50	80	.....	.....	4 06	2 30	6 36
West	Hopkins avenue .	Lansing avenue.....	70	112	8	.....	7 17	3 90	11 07

East	Hopkins avenue .	Alley south of Lanvale street	50	80	.....	.....	5 00	2 95	7 95
West	Hopkins avenue .	Alley south of Lanvale street	57	98	7	.....	6 08	2 95	9 03
West	Hopkins avenue .	Alley north of Lanvale street	58	98	7	.....	6 09	2 45	8 54
North	North avenue	Washington street	195	328	.....	.....	16 00	11 20	27 20
South	North avenue	Castle street	165	217	.....	.....	12 61	6 05	18 66
South	North avenue	Duncan alley.....	100	160	.....	.....	7 90	2 90	10 80
East	Central avenue...	Alley north of Baltimore st..	20	40	.....	.....	3 20	1 80	5 00
South	Jackson street....	Central avenue	300	240	.....	.....	37 40	13 50	50 90
West	Eden street	Union alley	64	70	10	.....	8 80	3 60	12 40
North	Pratt street	Eden street.....	48	24	.....	.....	5 50	2 50	8 00
West	Collington avenue	Fairmount avenue.....	210	346	52	61	35 50	11 50	47 00
North	Twenty-first st ...	Alley east of St. Paul street .	55	66	.....	.....	7 48	30	7 78
South	Twenty-first st ...	Alley east of St. Paul street .	45	45	.....	.....	5 85	30	6 15
North	Twenty-first st ...	Alley east of Calvert street ..	50	80	.....	.....	7 40	30	7 70
North	Twentieth street..	Alley west of Guilford avenue	85	85	.....	.....	11 05	30	11 35
North	Twentieth street..	Alley east of Calvert street ..	45	45	.....	.....	5 85	30	6 15
South	Twentieth street..	Alley east of St. Paul street .	.....	.....	.....	.....	.....	1 50	1 50
West	Stricker street....	Alley south of Ramsay street	96	40	.....	.....	5 50	18	5 68
East	Gilmor street.....	Cole street.....	201	64	.....	.....	9 45	16	9 61
South	McHenry street ..	Alley west of Pulaski street .	45	28	.....	.....	4 35	20	4 55
West	Payson street	Alley south of McHenry st..	117	17	.....	.....	4 36	.....	4 36
East	Vincent street....	Baker street	175	78	.....	4	12 71	4 00	16 71
West	John street	Alley south of Lafayette ave.	35	15	.....	.....	2 08	.....	2 08
South	Baker street.....	Alley south of Druid Hill ave.	150	20	.....	.....	7 21	.....	7 21
West	McCulloh street ..	Clendinen street	287	160	20	.....	16 17	8 56	24 73
East	McCulloh street ..	Clendinen street	286	160	20	.....	16 16	8 56	24 72
East	Druid Hill avenue	Clendinen street	108	90	5	.....	8 33	8 27	16 60
North	North avenue....	Monroe street.....	165	183	.....	.....	15 29	9 00	24 29
South	Fayette street	Greene street	170	197	15	.....	11 50	5 28	16 78
East	St. Mary street ...	Little Monument street.....	34	47	.....	.....	5 04	1 00	6 04
West	St. Mary street ...	Little Monument street	36	47	.....	.....	5 04	1 00	6 04
West	Orchard street....	Little Monument street.....	36	46	.....	.....	5 05	2 00	7 05
South	Oliver street	Castle street	151	.....	.....	.....	9 17	60	9 77
			5,581	5,713	210	90	$521 30	$205 21	$726 51
East	Harford ave.....	Alley south of North avenue,	50 square feet. Flagstone furnished by city, but laid by private party.						

REPAIRS TO OLD FLAGSTONE CROSSINGS.

Side.	Streets, Etc.	Across.	Square Feet.		Lineal Feet.		Cost.		
			Flag.	Cobble.	Gutter.	Kerb.	Labor.	Material.	Total.
East	Linden avenue...	Monument street	200	100	.....	.....	$21 68	$3 00	$24 68
East	Monroe street....	McHenry street.....	47	33	.....	.....	3 45	12	3 57
West	Monroe street....	McHenry street.....	48	33	.....	.....	3 45	13	3 58
South	Hollins street	Mount street	27	20	.....	.....	1 62	.....	1 62
North	Hollins street	Mount street	27	20	.....	.....	1 63	.....	1 63
North	Lanvale street....	Jordan alley.....	90	12	.....	.....	1 67	... .	1 67
North	Lanvale street....	Park avenue	35	39	.....	.....	2 08	.....	2 08
West	North avenue....	Jordan alley.....	75	69	9	.....	10 58	.....	10 58
			549	326	9	.....	$46 16	$3 25	$49 41

COMPARATIVE AMOUNTS AND COST OF WORK DONE IN 1901 AND 1902.

Various Kinds of Work.	Square Feet.		Per Square Foot.		Total Cost.	
	1901.	1902.	1901.	1902.	1901.	1902.
Cobble-stone repaving	2,155,191	2,428,599	.0370	.0373	$79,777 96	$90,679 99
Belgian block "	30,907	178,866	.0502	.0417	1,551 53	7,458 71
Mosaic " "	7,387	16,245	.1105	.1003	816 54	1,630 47
Asphalt " "	103,374	155,837.16	.1325	.1114	13,702 63	17,359 55
Vitrified brick "	.....	29,418.75	.....	.1037	.....	3,052 58
Sheet asphalt "	24,475.44	19,286.10	.2319	.2398	4,985 05	4,625 39
New vitrified brick footway crossings	13,629.6	20,961.9	.2044	.1911	2,791 00	4,008 96
Old flagstone reset	27,504	33,081	.0834	.0834	2,293 90	2,758 96
New flagstone set	573	617.8	.3634	.3334	208 30	205 97
	Lineal Feet.		Per Lineal Foot.			
Old gutter-stone reset	97,901	104,409.3	.0328	.0328	3,211 15	3,424 63
New standard gutter-stone set	20,332.6	20,620.5	.3128	.2828	6,360 04	5,831 47
" hammer-dressed gutter-stone set	1,985	7,426.2	.2128	.2328	422 42	1,728 82
Old 4½-inch kerbstone reset	52,520.5	69,284.1	.0707	.0707	3,713 20	4,898 39
New 4½ " " set	2,836.7	6,899.4	.6207	.6525	1,760 74	5,454 59
" 4½ " kerb circles set	32.83	106	1.30	1.30	42 68	137 86
Old 6 " kerbstone reset	427	4,381.5	.1026	.13	43 81	569 60

Location.	From	To	Character of Work.	Expended.		
				For Labor.	For Material.	Total.
Roland avenue...	Hickory avenue...	Merryman's avenue	Grading roadway, repairing bulkhead, filling washout, cleaning gutters, laying 6-inch drain under bulkhead; laying flag-row across Fourth avenue and repaving gutters.....	$277 24	$ 19 23	$296 47
Huntingdon ave..	Twenty-fifth street.	Thirtieth street....	Repairing roadbed with broken stone and cinders, and repairing paved gutters.....	13 03	5 30	18 33
Jenkins lane.....	Cromwell street ...	Harford road.....	Cleaning gutters, building berms and repaving roadbed with old cobblestone, broken stone and cinders.....	154 32	62 08	216 40
Old York road ...	York road	New Boundary ave.	Laying new 15-inch terra-cotta pipe under road at Tinges lane; repairing roadbed with broken stone, gravel and cinders; cleaning gutters and replacing with 12 inch terra-cotta pipe the old stone culvert across Windermere avenue..	190 18	105 24	295 42
Montebello ave...	Old York road	Gorsuch avenue...	Cleaning gutters and repairing roadbed with old cobblestone and cinders	34 71	.....	34 71
Gorsuch avenue..	Old York road	Montebello avenue.	Renewing terra-cotta pipes at Old York road, cleaning gutters, re-			

			pairing culverts and paving new gutters on top of fill	813 71	667 28	1,480 99
Third avenue	Roland avenue....	Druid avenue	Grading for and paving new gutters, repairing roadbed with cinders and broken stone, repaving old gutters, cleaning gutters and laying new flag-row at Hickory avenue	111 90	17 44	129 34
Falls road	Glen Edwards ave.	Third avenue	Opening and repairing old stone culvert, repairing roadbed with broken stone and cinders, and cleaning and repairing gutters ...	22 58	24 39	46 97
Oxford avenue ...	York road	Boone street	Resetting kerb and repairing gutter and rebut	17 29	2 40	19 69
Twenty-fifth street	York road	Huntingdon ave...	Repairing roadbed with broken stone, cinders and gravel, repaving gutters, cleaning gutters and repairing culvert	79 70	143 62	223 32
Loney's lane.....	Philadelphia road .	Northern city limit	Cleaning gutters, repairing roadbed with cinders, shells, gravel, old cobblestone and broken stone, and repairing culverts and gutters ...	464 14	119 92	584 06
Philadelphia road.	Lakewood avenue.	Loney's lane.....	Repairing roadbed with broken stone, cinders, shells and old cobblestone, cleaning and opening gutters	102 34	130 88	233 22
Cedar avenue.....	Jones' Falls	Merryman avenue.	Repaving gutters, repairing roadbed with cinders, gravel and broken stone, cleaning gutters, rolling roadbed and repairing washout	688 57	539 95	1,228 52
Merryman ave ...	Falls road	York road	Repairing washouts, paving gutters, cleaning gutters, repairing culverts and roadbed and building bulkheads	115 83	8 73	124 56

MACADAM ROADS, AVENUES AND LANES.—Continued.

Location.	From	To	Character of Work.	Expended.		
				For Labor.	For Material.	Total.
Remington avenue	Thirtieth street....	First avenue	Putting roadbed in thoroughly first-class condition with gabbro broken stone and gneiss screenings, sprinkling and rolling same, repaving gutters and repairing bulkheads and fences	$697 61	$2,763 34	$3,460 95
First avenue	Remington avenue.	Cedar avenue	Repairing roadbed with gabbro broken stone and gneiss screenings, rolling and sprinkling same, cleaning gutters and repairing fences	.....	.....	.....
First avenue	Cedar avenue	Chestnut avenue ..	Cleaning gutters, paving gutters and repairing roadbed with gneiss broken stone and cinders, and rolling and sprinkling same	370 26	915 55	1,285 81
Sinclair avenue...	Belair road.....	Loney's lane	Cleaning gutters, repairing gutters, cleaning drains and repairing roadbed with old cobblestone, cinders and broken stone.....	72 24	98 49	170 73
Union avenue....	Jones' Falls	Falls road	Repairing roadbed with broken stone and cinders and cleaning and repairing gutters.....	19 59	71 67	91 26
Twenty-seventh st	Maryland avenue .	Charles street	Opening gutters and hauling dirt .	8 18	.....	8 18
Twenty-first street	Maryland avenue..	Charles street	Cleaning gutters and hauling dirt.	4 94	.....	4 94
Twenty-third st ..	Charles street	Hampden avenue .	Repairing paved gutters.....	10 40	.....	10 40

Thirtieth street...	Huntingdon ave...	Remington avenue.	Repairing roadbed with gabbro broken stone and gneiss screenings, rolling and sprinkling same.	99 48	332 33	431 81
Elm avenue.....	Third avenue	Merryman avenue.	Cleaning gutters and repairing roadbed.....	23 05	.....	23 05
Wilson street	York road	Barclay street.....	Paving gutter across street in place of old wooden box removed	19 43	10 00	29 43
Fourth avenue...	Schoolhouse	Falls road.....	Cleaning gutters and repairing roadbed.....	25 83	7 00	32 83
Twenty-sixth st ..	St. Paul street.....	Maryland avenue .	Repairing flag-row and roadbed and opening and cleaning gutters	32 74	.....	32 74
Charles street	Twentieth street...	Twenty-fifth street.	Repairing gutters and rebuts	11 33	.....	11 33
Chestnut Hill ave.	York road	East end.....	Filling roadbed with sand and gravel and cleaning gutters.....	33 25	77 45	110 70
Hampden avenue.	.....	.....	Repairing gutter across Twenty-eighth street...	13 04	5 08	18 12
Twenty-eighth st.	Huntington ave...	Hampden avenue.	Paving gutters and repairing roadbed with gravel and cinders.....	31 87	17 91	49 78
Twenty-fourth st.	York road.....	Barclay street.....	Repairing gutters, cleaning gutters and repairing roadbed with old cobblestone and gravel.....	18 58	2 20	20 78
Jefferson street...	Republic street....	Montebello avenue	Opening and cleaning gutters.....	19 87	.....	19 87
Friendship street.	Reese street.....	York road.....	Cleaning gutters.....	9 00	.....	9 00
Brady avenue....	Reese street.....	Frisby street.....	Cleaning gutters.....	8 25	.....	8 25
Mount street.....	Reese street.....	Frisby street.....	Cleaning gutters.....	8 25	....	8 25
Erdman avenue..	Harford road.....	Belair road.....	Repairing culvert.....	1 04	.....	1 04
Taylor street....	Jefferson street....	Madison street....	Paving new gutter in place of old wooden box from alley south of Jefferson street.....	25 58	.....	25 58
Valley street.....	.....	.....	Cleaning terra-cotta pipe at Mount street	4 08	....	4 08
Independence st..	Gorsuch avenue...	Friendship street..	Cleaning gutters.....	6 58	....	6 58
Washington st....	.....	.....	Replacing old wooden box across Harrison street with 15-inch terra-cotta pipe.....	35 34	17 01	52 35

MACADAM ROADS, AVENUES AND LANES.—Continued.

Location.	From	To	Character of Work.	Expended.		
				For Labor.	For Material.	Total.
Jackson street....	Jefferson street....	Madison street....	Repairing old drain box.....	$ 6 58	.....	$ 6 58
Carroll avenue...	Old York road....	East End.....	Repairing washout.....	3 37	$ 5 60	8 97
Reese street.....	Oxford avenue....	Friendship street..	Cleaning and opening gutters.....	3 67	.....	3 67
Chestnut avenue.	.....	.....	Repaving gutters and repairing roadway at Second avenue	19 33	30 13	49 46
Sycamore avenue,	Third avenue	Union avenue.....	Repairing roadbed with broken stone, cinders and gravel and repaving gutters.....	80 35	135 67	216 02
Wilkens avenue..	Bentalou street....	Southern city limit.	Driveway from Bentalou street to Gwynn's Falls bridge, was repaired with gneiss crushed stone, then rolled with steam roller; west from bridge some crushed stone was used, washouts and fences repaired; also paved a gutter across Brunswick street, south side of Wilkens avenue.....	136 56	417 35	553 91
Millington lane..	Frederick road....	Wilkens avenue...	Repaired roadbed with gneiss crushed stone, then thoroughly rolled it, and cleaned gutters....	46 57	129 64	176 21
Brunswick street.	Frederick road....	Wilkens avenue...	Repaired roadbed with gneiss crushed stone, then rolled it with steam roller.....	3 74	47 38	51 12
Dorsey lane.....	Old Frederick road.	Westerly street ...	Repaired box culvert and cleaned gutters.....	49 51	.....	49 51

Stafford lane.....	Frederick road....	Carroll avenue....	Repaired washout and cleaned gutters.....	32 67	.....	32 67
Pimlico boulevard	Reisterstown road .	Northern city limit	Repaired driveway in places with gabbro crushed stone, cleaned gutters, repaved 1,030 square feet asphalt block gutter, removed old kerb in front of and placed new 4½-inch regulation kerb on north and south sides of Kate avenue, across west footway of the boulevard	355 73	99 06	454 79
Kate avenue	Garrison avenue...	Macadamized portion	This part of the avenue was graded and gutter-ways made on the sides, shaped up and opened as a dirt road to the public; twenty-four lineal feet of 24-inch double strength terra-cotta pipe were laid across the avenue in the line of a stream east of Lewin avenue, also 16 lineal feet of 16-inch terra-cotta pipe were laid at another point ..	247 17	65 67	312 84
Kate avenue	Point west of W. M. R. R. crossing....	Pimlico boulevard.	Repaired roadbed with gabbro crushed stone, cleaned gutters and laid 32 lineal feet of 18-inch double strength terra-cotta pipe in line of west gutter of Reisterstown road, across the avenue to open it to the public from Reisterstown road to Pimlico boulevard.....	28 34	249 62	277 96
Garrison avenue..	Old Liberty road ..	Kate avenue	Repaired roadbed with some gabbro crushed stone and cleaned gutters	7 34	15 00	22 34
Clifton avenue ...	Pennsylvania ave .	Woodbrooke ave ..	Repaired cobblestone pavement at school-house	7 71	.....	7 71

MACADAM ROADS, AVENUES AND LANES.—Continued.

Location.	From	To	Character of Work.	Expended.		
				For Labor.	For Material.	Total.
Eutaw Place.....	Whitelock street ..	Druid Hill Park entrance.....	Repaired roadbed with gabbro crushed stone	$ 18 67	$157 46	$176 13
Wetherdsville rd .	Dead Run bridge ..	Western city limit.	Repaired roadbed with gabbro crushed stone	13 67	56 00	69 67
			Gabbro crushed stone placed over Dead Run bridge.....	8 33	8 00	16 33
Fifth avenue.....	Greenspring avenue	Pimlico boulevard.	Repaired roadbed with gabbro crushed stone	1 58	32 00	33 58
Woodberry ave ..	Greenspring avenue	Parkdale avenue ..	Repaired washout	9 09	... .	9 09
			Repairs to steam roller and labor incident to getting it out of gutter on Franklin street.....	15 67	.....	15 67
Eighth street.....	North avenue.....	Walbrook avenue.	Cleaned gutters and repaired washouts.....	21 00		21 00
Ninth street.....	North avenue.....	Walbrook avenue.	Repaired roadbed with some gabbro crushed stone and cleaned gutters.	130 47	72 00	202 47
Seventh street...	North avenue.....	Walbrook avenue.	Shaped roadbed and cleaned gutters.....	63 67		63 67
North avenue....	Smallwood street..	Twelfth street.....	Resurfaced the roadbed with gabbro crushed stone wherever needed, repaired paved gutter washouts, cleaned gutters and repaired portion not macadamized with rotten rock.....	158 32	218 00	376 32
Walbrook avenue.	Slingluff avenue...	Seventh street.....	Repaired roadbed and cleaned gutters.....	16 33		16 33

Slingluff avenue..	North avenue.....	Old Liberty road ..	Shaped up roadbed and cleaned gutters.....	14 67	.....	14 67
Clifton avenue...	Twelfth street.....	Chelsea avenue....	Repaired washout, cleaned gutters and set 23.33 square feet flagging at Thirteenth street....	8 41	.....	8 41
Windsor Mill road	Gwynn Oak avenue	Western city limit.	Repaired roadbed, washouts and cleaned gutters.....	50 20	1 71	51 91
Beech avenue....	Slingluff avenue...	Liberty road	Shaped up roadbed and cleaned gutters	52 50	.....	52 50
Northwest street..	Seventh street.....	Eighth street.....	Shaped up roadbed and repaired washouts	33 33	.....	33 33
Old Liberty road.	Reisterstown	Liberty road	Repaired roadbed in places with gabbro crushed stone and cleaned gutters	72 88	30 00	102 88
Shirley's lane	Green Spring ave..	Pimlico boulevard.	Repaired washouts and cleaned gutters.	10 50	.....	10 50
Forrest avenue...	Garrison avenue...	Southern terminus.	Repaired roadbed in places with gabbro crushed stone and cleaned gutters.....	6 67	30 00	36 67
Fairview avenue.	Liberty road	Southern terminus.	Repaired roadbed with gabbro crushed stone and cleaned gutters	3 33	95 00	98 33
Springdale avenue	Liberty road	Southern terminus.	Repaired roadbed with gabbro crushed stone and cleaned gutters	8 33	7 50	15 83
Cleveland avenue.	Liberty road	Forrest avenue....	Repaired roadbed with gabbro crushed stone, cleaned gutters and reset flag-rows at intersection Springdale avenue.....	9 67	66 76	76 43
Calloway avenue.	Liberty road	Old Liberty road..	Repaired roadbed in places with gabbro crushed stone, cleaned gutters and furnished 50 lineal feet 15-inch terra-cotta pipe with four special pieces to replace wooden box drain across avenue at alley between Forrest and Springdale avenues, to Mr. Calloway, who laid same at his expense	14 54	96 08	110 62

MACADAM ROADS, AVENUES AND LANES.—Concluded.

Location.	From	To	Character of Work.	Expended.		
				For Labor.	For Material.	Total.
Caton avenue....	Wilkens avenue...	Frederick road....	Resurfaced roadbed with four to six inches in depth of gneiss crushed stone, over which was spread stone screenings, and then thoroughly rolled it.....	$159 09	$804 01	$963 10
Augusta avenue..	Frederick road....	Old Frederick road.	Resurfaced the roadbed wherever it needed it with gneiss crushed stone and rolled it with steam roller	119 88	178 53	298 41
Baltimore street..	.....	.....	Repaired washout at Peck's Run .	16 33	.....	16 33
Irving avenue....	Frederick road...	Old Frederick road.	Graded, filled and shaped roadbed and opened gutterways.....	162 66	.....	162 66
Old Frederick rd .	Frederick road....	Western city limit.	Repaired driveway in places with gneiss crushed stone and cleaned gutters.....	39 33	137 77	177 10
Garrison lane.....	Frederick road....	Edmondson avenue	Resurfaced roadbed with gneiss crushed stone from four to six inches in depth from Frederick road to Baltimore street, and rolled it with steam roller, repaired the other portion wherever needed and cleaned gutters .	163 81	693 88	857 69
Garrison lane	Franklin street....	B. & P. R. R.....	Laid 20 lineal feet of 18-inch double-strength terra-cotta pipe across roadway in place of wooden drain torn out.....	15 83	12 06	27 89

Calverton road...	Hollins street.....	Edmondson avenue	Resurfaced roadbed with gneiss crushed stone wherever needed, rolled it and cleaned gutters.....	107 64	315 61	423 25
Hollins lane	Calverton road....	Landwehr lane....	Repaired wooden box gutter.....	26 84	.....	26 84
Franklin street...	Bentalou street....	Calverton road....	Resurfaced roadbed with gneiss crushed stone from four to six inches in depth, in places, rolled it with steam roller and cleaned gutters.....	139 02	345 70	484 72
Caton avenue	East side.....	Across Carroll ave.	Laid 26 lineal feet of 15-inch terra-cotta pipe to replace old wooden box drain.....	5 67	9 21	14 88
Edmondson ave..	Calverton road....	B. & P. R. R.....	Repaired with gneiss crushed stone wherever needed; rolled it with steam roller and cleaned gutters .	23 75	218 74	242 49
Edmondson ave..	Calverton road....	Western city limit.	Laid 30 lineal feet 8-inch terra-cotta pipe in line of gutter across roadway west of bridge; laid a drain tile 125 feet long from centre of driveway at a point east of Seventeenth street, to drain a spring that arose there every winter and wrecked the roadbed, then resurfaced the driveway over it with gabbro crushed stone and cleaned gutters	341 66	83 25	424 91
Eighth street.....	Frederick road....	Stafford street.....	Repaired washout and cleaned gutters.....	16 34	.....	16 34
Eighth street.....	Intersection.....	Northwest street...	Repaired washouts.....	24 75	.....	24 75

UNPAVED STREETS.

Location.	From.	To.	Character of Work.	Expended.		
				For Labor.	For Material.	Total.
Mine Bank lane..	North avenue.....	Hoffman street.. .	Partly graded and opened-up roadway in line of lane, it being almost practically closed to the public	$247 66	$5 78	$253 44
Northwest street..	Fulton avenue....	Friendsbury Place.	Repaired washouts, opened gutters and shaped-up roadway.....	58 67	.....	58 67
Pressbury street..	Fulton avenue....	Friendsbury Place.	Opened gutters and shaped-up roadbed.....	25 41	.....	25 41
Friendsbury Place	Intersection.....	Pressbury street...	Repaired washouts and opened gutters	12 42	.....	12 42
Presstman street..	Fulton avenue....	Monroe street.....	Opened gutters.....	7 42	.....	7 42
Appleton street..	Intersection.....	Northwest street ..	Opened gutters.....	1 03	.....	1 03
Monroe street....	Intersection.	Northwest street ..	Opened gutters.....	1 05	.....	1 05

The following is a statement of the expenditures for labor and materials credited to the appropriations for "Repairs of Roads, Streets, etc.," and for the "Paving and Repairing of Cross Streets:"

Appropriated for repairs of roads, streets, etc.	$173,949 75
Appropriated for paving and repairing cross streets	15,000 00
Expended for labor charged to repairs of roads, streets, etc.	$103,448 87
Expended for labor charged to paving and repairing cross streets	5,691 95
Expended for materials charged to repairs of roads, streets, etc.	$67,321 30
Expended for materials charged to paving and repairing cross streets	2,068 18

The following itemized statement shows the amount and character of expenditures under the following accounts, viz.: "Repairs of Roads, Streets, etc.," "Paving and Repairing Cross Streets," "Footway Crossings," "Private Paving and Inspection," "Maintenance of Property Yard," "Incidentals," "Repairs of Sewers," "Additions in and Improvements to Drainage System," "Widening North avenue and Changing Gutters at Peck's Branch," and "Maintenance of Bridges and Culverts:"

Labor		$118,499 79
3,521.57	perches of new cobblestone	$6,981 99
3,084.58	perches of old cobblestone	3,430 62
	(203.19 perches cobblestone, $327.00, 1901)	
21,686.80	lineal feet of standard gutterstone	5,451 66
7,426.2	lineal feet of hammer-dressed gutterstone	1,476 82
6,899.40	lineal feet of 4½-inch regulation kerbstone	3,793 09
106	lineal feet of 4½-inch regulation circles	116 72
22,241.1	cubic yards of paving sand	12,510 91
1,541.9	cubic yards of screened sand	1,148 07
2,005.75	cubic yards of gabbro crushed stone	4,886 83
2,687.24	cubic yards of gneiss crushed stone	4,111 20
716.13	cubic yards of gneiss screenings	690 75
8,784	cubic yards of cinders	2,604 09
617.82	square feet of flagstone	154 46
184,264	asphalt blocks	11,795 16

26,070	Belgian blocks	$1,198 36
159,859	vitrified Canton blocks	3,843 67
	(11,000 vitrified Canton blocks, $264.00, 1901) ...	
8.6	tons of granolithic stone	21 01
24	tons of coal	92 30
160	old railroad ties	8 00
550	lineal feet of terra-cotta pipe, various sizes	215 38
	Various kinds of lumber	152 40
	Various kinds of cement	68 29
	Oils, lamps, globes, etc	236 49
	Hardware, brooms, rope, tools, etc	432 51
	Old canvas	25 32
	Filling (contracts)	211 05
	Insurance on boiler (steam roller)	30 00
	Repairs to scraper (steam roller)	10 00
	Water for steam roller (Baltimore County Water Company)	1 20
	Sprinkler attachment for cart	32 50
	Ten per cent. retained on repairs to sheet asphalt, 1901	338 95
	Metallic and steel tapes	21 00
	Hauling, old ties, gutter plates, kerb, bricks, old cobble, etc	2,289 27
	Repairing pump, valve, tapes, etc	6 27
	Drain tile, old tubing, rollers, etc	25 95
	Draughting materials	5 52

The following expenditures were made under Mr. O. W. Connett, Assistant City Engineer, before those kinds of repairs were placed in my charge, the amount of work not being given:

Location.	Kind of Pavement.	Labor.	Material.
Chase street and Maryland avenue	Vitrified brick	$12 34	$13 30
Chase and Gay streets	Sheet asphalt	4 46	.....
Lexington and Poppleton streets	Asphalt blocks	12 31	12 65
Lexington and Arlington streets	Asphalt blocks	9 33	11 00
Lexington and Amity streets	Asphalt blocks	4 67	.....
Fulton avenue and Mosher street	Asphalt blocks	9 33	12 10
Holliday street between Baltimore and Fayette streets	Sample pavement	18 75	.....
Mt. Royal ave. and Cathedral street	Sheet asphalt	17 82	1 42
		$89 01	$50 47

MAINTENANCE OF PROPERTY YARD.

Much of the old material in the yard, the accumulation of years, was either used or disposed of by sale, enabling the keeper by the acquisition of more room to better arrange all incoming material for temporary storage.

No small refuse stone was permitted to be hauled into the yard from street repair gangs, as heretofore, and each kind of material was placed to itself, so that it could be readily reached whenever needed.

The same force was continued in employment the past year.

During the months of January, February and March, the blacksmith was employed in reinforcing with new iron and steel all picks partly worn out, and in putting in thorough repair all other tools used in the department.

The expense incurred in purchasing new tools the past year was in consequence reduced to a minimum.

A new house extension was built for the storage of the bridge department's appurtenances.

Appropriated for maintenance of yard for 1902		$1,500 00
Expenditures.		
Superintendent's salary	$720 00	
Assistant Superintendent's salary	606 00	
Cleaning sink	7 50	
Two eye-rollers	4 50	
Hardware	5 66	
Roofing felt	28 80	
Total		$1,372 46

The following is an account of the amount and value of new material in stock, for the use of the department, at the end of the year, viz:

229	5x4x12-inch new asphalt blocks	at $0.06½ ..		$14 89
59	4x4x12-inch new asphalt blocks	at .06 ..		3 54
55.5	lineal feet new standard gutterstone	at .25 ..		13 87
5.83	lineal feet new 4½-inch kerbstone	at .55 ..		3 21
6,867	new vitrified Canton blocks			164 81
6,000	new Belgian blocks			300 00
				$500 32

The only outstanding requisition for material, and that charged to account of "Footway Crossings" 1902, and to be used in 1903, is for 346.64 square feet of flagstone at $0.25, $86.66.

The appropriation for "Repairs of Roads, Streets, etc." for 1902 was entirely expended.

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.

All the repairing over new lines of ducts, excepting that done in private streets and alleys, was done by this department, bills for the cost of which were rendered from time to time.

New lines of ducts were laid in the northern and northwestern sections of the city, as follows: 10,991.47 lineal yards, and the amount of work done over new lines of ducts during the year was as follows:

114,412	square	feet	of	cobblestone repaving.
10,668	"	"	"	Belgian block "
5,707	"	"	"	asphalt block "
5,688	"	"	"	Mosaic block "
1,460	"	"	"	vitrified brick "
29	lineal	"	"	gutterstone relaid.
28	square	"	"	flagstone "

The amount of repair work done over old lines of ducts was as follows:

2,792	square	feet	of	cobblestone repaved.
887	"	"	"	Belgian block "
56	"	"	"	flagstone relaid.
384	"	"	"	vitrified brick repaved.

The total expenditures for old and new work were as follows:

Expended for labor	$3,910 79	
" " materials	1,266 14	
" " sheet asphalt (contract)	67 70	
		$5,244 63

The total number of lineal feet of ducts laid by this company to date and subject to franchise tax, is 170,863 feet 3 inches, or 56,954.4 lineal yards.

This amount does not include 10,102 lineal feet of ducts laid in private streets and alleys and over which the telephone company repaved.

The following amount charged to the account of "Repairs to Roads, Streets, etc.," was expended to do repaving over the company's trenches towards the close of the season, and for which bills will be rendered against it:

For labor	$ 116 66	
For material	12 98	
		$ 129 64

STEAM RAILWAYS.

There was but little new work of any kind done along the surface lines of steam-railway tracks in the city during the year except general repairs.

THE BALTIMORE AND OHIO RAILROAD COMPANY.

There were no new tracks or curves laid or alterations made to existing tracks in the streets, but a temporary single track was laid in Gay street and Pratt street to the north side of Lombard street for use in delivering material pending the construction of the United States Custom-house.

The company made all repairs to street pavements within and two feet outside its tracks in a satisfactory manner.

THE MARYLAND AND PENNSYLVANIA RAILWAY COMPANY.

The bridge begun last year over its right of way across Remington avenue, southeast of First avenue, was completed, and the surface approaches to the bridge put in good condition.

The fence temporarily changed was restored to the proper line in a satisfactory manner.

THE PHILADELPHIA, BALTIMORE AND WASHINGTON RAILROAD COMPANY.

There was no new work constructed by this company during the past year outside of general repairs to street pavements along its tracks in the city.

The kerb, gutter-stone and cobble-stone paving in the bed of Hoffman street, east and west from Central avenue, which had been displaced by the cave-in of the tunnel arch on June 29, of last year and by the reconstruction of the defective portion of the tunnel arch, was satisfactorily restored in the early part of the year.

THE NORTHERN CENTRAL RAILWAY COMPANY.

The only new work this company did was the moving of its tracks or siding now crossing the bed of Madison street just west of Jones' Falls slightly to the east of its present location, and the construction next thereto of an additional track or siding in the bed of and across Madison street.

Permission was granted to the company to do this work under Ordinance No. 61, approved June 9, 1902.

All the street pavement disturbed by the construction of this work was restored in a satisfactory manner.

The street pavement within and two feet outside its tracks, in the city, was kept in good condition.

ELECTRIC STREET RAILWAYS.

Under Ordinance 44, approved April 15, 1902, the following changes and additions were made in tracks of the United Railways and Electric Company, the only electric railway operating within the city of Baltimore. Curves were put in at Center and Calvert streets to change the route of the Edmondson avenue cars from Center street east of Calvert street to Calvert street, to Pleasant street, connecting at Hillen and Holliday streets with existing tracks, thus doing away with the dangerous grade crossing over the Northern Central tracks at North and Center streets.

In this connection a double track and curves were laid on Pleasant street from Calvert street to Holliday street.

A double track curve was put in at Preston and Brevard streets, one at Preston and Washington streets, one at Washington street and North avenue, and one at North avenue and Harford road. An extension and a single track curve were put in at Pennsylvania avenue and Retreat street.

A double track curve was put in at Light street and Fort avenue, one at Pennsylvania avenue and Franklin street, and one at Pennsylvania avenue and Cumberland street.

At this point was also laid a short double track extension.

At Preston street and Milton avenue a double track curve was laid.

On Garrison avenue a double track extension was laid from Ridgewood avenue to Northern City limit.

An extension was laid at Twelfth street and Clifton avenue.

Curves were put in from Clifton avenue to Windsor Mill road and from Clifton avenue to Liberty road.

An extension was laid along Pennsylvania avenue at Fulton avenue, and also along Fulton avenue from Pennsylvania avenue to Clifton street.

Curves were put in at Pennsylvania and Fulton avenues, and at Charles and Ostend streets.

In connection with the above improvements, tracks were removed at the following locations, viz: Double tracks on Center street, from Calvert street to Front street, and on High street, from Front street to Hillen street; a single track on Windsor Mill road, northwest from Twelfth street; double tracks and curves from Liberty road to Twelfth street; double track on Clifton avenue, from Fulton avenue to Francis street; double track on Ostend street, from Charles street to Light street, and double tracks and curves from Fayette and Wolfe streets.

In addition to these changes and improvements done under authority of ordinances, many of the old crossings

and curves were replaced with new and more modern ones, and considerable new and heavier rails were put in, replacing inferior and worn out ones.

There was laid a 15-inch iron pipe across Park avenue, east side of Biddle street, with inlet openings at the southwest corner of Biddle street and Park avenue, and with an outlet constructed of iron gutter plates at the southeast side of Biddle street.

This construction removes the cross gutter partly open and partly covered with iron plates.

A 15-inch iron pipe was put in across Ostend street on west side of Charles street, with an opening at the southwest corner of Ostend and Charles streets. This removes the gutter plate construction that was formerly in at this point.

THE BALTIMORE REFRIGERATING AND HEATING COMPANY.

Under Ordinance No. 18, approved December 12th, 1901, permission was granted Richard B. Fentress and Summerfield B. Medairy, their successors or assigns, to construct, lay, operate and maintain subways and pipe-lines, upon, under and along certain streets, lanes and alleys in the City of Baltimore, and within the following bounds, viz: On the east by Central avenue, on the south by Lee street, on the west by Greene street, and on the north by Franklin street.

On April 5th, 1902, a permit was issued to Messrs. Fentress and Medairy to dig test holes in Wayne street, from a point 150 feet west from Eutaw street, and in Eutaw street and Pratt street east from Eutaw street.

On April 12th, 1902, they obtained a permit to begin the construction of their conduits, but failed to do anything until November 20th, when they again secured a permit to dig test holes, followed on the 21st by another permit to begin construction.

From their powerhouse, located on Wayne street about 150 feet from Eutaw street, they began construction, and their main line of conduit is completed in Wayne street to

Eutaw street, and in Eutaw street, west side, to a point northeasterly in Eutaw street, a total distance of 372 feet.

The ordinance empowers the City Engineer to supervise and restore all pavements displaced by the laying of their conduits.

No repaving has as yet been done.

CONSOLIDATED GAS COMPANY.

In addition to repairs made by this department to street pavements over the company's mains and services, and for which bills were rendered, the company also did considerable work in the way of repaving over all its new mains and services laid and over cuts made to repair leaks and broken pipes.

The amount, character and cost of work done by this department are as follows:

Over Service in Front of No. 611 Sewell Street.

16.6 square yards of sheet asphalt (contract)	$4 95

Over Services in Remington and First Avenues.

Expended for labor	$ 4 92	
Expended for material	14 07	
		$18 99

DRAIN-PIPES.

The repairs made by this department over drain-pipes embrace not only the pavements torn up by private individuals, but by the Inspector of Buildings as well.

Private individuals are required to have a permit and deposit a sum sufficient to cover the repaving.

For the work done for the Inspector of Buildings bills were rendered from time to time and were paid by that department.

A force of men is always available for making the necessary repairs over all drain-pipes.

The following statement gives the amount of work done in the restoration of the pavements over these drain-pipes and the cost thereof.

Repaving was done over drain-pipes leading from thirty public school-houses and nine fire-engine houses.

20,202	square feet of cobble-stone repaved.		
3,207	square feet of Belgian block repaved.		
551	square feet of asphalt block repaved.		
67.2	square feet of flag-stone reset.		
10	lineal feet of gutter-stone reset.		
	Amount expended for labor	$813 66	
	Amount expended for material	90 75	
			$904 61

DRAIN-PIPES OF INDIVIDUALS AND CORPORATIONS.

Repaving was done as follows:

Over 101 lines of newly laid pipes.

Over 234 places where drain-pipes were altered, reconstructed, relaid, replaced, etc.

Amount expended for labor	$1,783 40	
Amount expended for material	160 94	
		$1,944 34

WIDENING OF INTERSECTION MT. ROYAL AVENUE AND LANVALE STREET.

Under Ordinance No. 30, approved February 7th, 1902, the Association of Veterans of the Mexican War was authorized to erect a monument commemorative of soldiers who lost their lives in the Mexican war, at the intersection of Fayette street, Park avenue and Liberty street, but it was permitted in lieu of this location to use the site in the intersection of Lanvale street and Mt. Royal avenue.

To erect its monument at this point it was necessary to set back the park coping on the north and south sides of Lanvale street for a distance of 17.5 feet, in order to maintain a driveway on both sides of the monument.

To make this change $300 out of its appropriation of $5,000 granted it by the Mayor and City Council was allowed, but was insufficient to defray the entire cost.

The balance was charged to account of "Repairs of Roads, Streets, etc," but the value of old coping acquired will about compensate for the difference.

The expenditures were as follows:

Labor, tearing out, grading, resetting coping, laying and relaying asphalt blocks	$220 77
2,600 4x4x12-inch new asphalt blocks	156 00
13.5 cubic yards screened sand	10 27
2.05 cubic yards stone dust	2 05
Hauling 34½ ft. of 8 inch and 34 ft. of 6-inch coping to City Yard.	6 21
	$395 30

GRANITE COPING AT M'MECHIN STREET AND NORTH AVENUE.

Granite coping, eight inches wide and from fifteen to eighteen inches deep, was placed around the triangular plot of ground on the east side of No. 11 Truck House by this Department at the expense of the Inspector of Buildings Department.

There were 124.25 lineal feet of old straight and 10.10 lineal feet of circular kerb obtained from the property yard, which were rounded on the top, redressed and then used as coping.

In addition to the above, it required 69.10 lineal feet of new straight and 8.94 lineal feet of circular coping to complete the work.

Expended for labor	$120 81
Expended for material	279 59
	$400 40

There was also much office work in connection with the variety of work enumerated above.

In conclusion, I desire to commend my assistants for the faithfulness and efficiency in which they have discharged their respective duties, and to whom the work, accomplished in my branch of the Department, is in a great measure credited.

The force operating under me is as follows:

Mr. John S. Doyle, Assistant Engineer.
Mr. Joseph L. Wickes, " "
Mr. Wm. Smart, clerk.
Mr. Wm. W. Stockham, paving inspector.

JNO. S. PATTERSON,
Assistant City Engineer.

ANNUAL REPORT

OF THE

SUB-DEPARTMENT OF HEALTH,

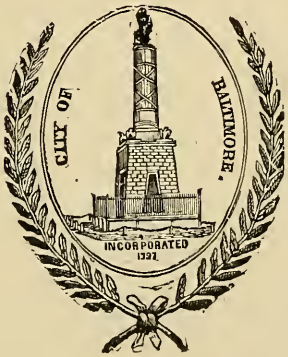
DEPARTMENT OF PUBLIC SAFETY,

TO THE

MAYOR AND CITY COUNCIL OF BALTIMORE,

FOR THE

Fiscal Year Ended December 31, 1902.



BALTIMORE:
THE JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER.

1903.

Officers and Employes of the Department of Public Safety.

SUB--DEPARTMENT OF HEALTH.

JAMES BOSLEY, M. D.,
Commissioner of Health.

C. Hampson Jones, M. D.,
Assistant Commissioner of Health.

Sydney O. Heiskell, M. D.,
Assistant Commissioner of Health (Quarantine).

Thadeus W. Clarke, M. D.,
Assistant Quarantine Physician.

J. W. M. Kiger,
Secretary Department of Health.

Arthur D. Thompson,
Assistant Secretary Department of Health.

William Royal Stokes, M. D., *Bacteriologist.*

Gustav W. Lehmann, Ph. D., *Chemist.*

Nicholas G. Kierle, M. D., *Medical Examiner.*

B. P. Muse, M. D., *Assistant Medical Examiner.*

Joseph C. Mitchell, *Inspector of Plumbing and Drainage.*

G. R. Minnick, C. H. Inderrieden,
Assistant Inspectors of Plumbing and Drainage.

Francis A. Ebberts, *Inspector of Drains.*

Francis X. Jenkins, *Nuisances Clerk.*

Harry C. Andrews, *Permit Clerk.*

John H. Uhlenberg, *Registrar's Clerk.*

Chas. A. Wall, George C. Wedderburn, *Index Clerks.*

Alan W. Smith M. D., *Inspector of Throats.*

George F. Schultz, *Inspector of Dairies.*

W. B. Roth, C. A. Lerian, Chas. Knell, H. G. Wilson and C. M. Brodwater,
Inspectors of Food.

H. J. Hahn, *Inspector of Bakeries.*

J. A. Campbell, *Laboratory Clerk.*

Eleazer Goldberg, *Commissioner's Clerk.*

Patrick R. Glynn, *Keeper of Morgue.*

Wm. E. Woodall, *Maker of Disinfectants.*

Thomas E. Morse and George W. Phillips, *Disinfectors.*

Herman M. North and August Rittmiller, *Drivers of Funeral Wagon.*

John B. Weilage, Mortimer Bye, Grover Benser and George Karl,
Laboratory Assistants.

J. Charles Roemer, *Messenger.*

LIST OF HEALTH WARDENS.

First Ward—J. W. WILLIAMS, M. D.

Second Ward—J. A. SCHULTE, M. D.

Third Ward—C. M. SCHULTE, M. D.

Fourth Ward—THOS. SUDLER, M. D.

Fifth Ward—F. A. SAUER, M. D.

Sixth Ward—A. C. HEARN, M. D.

Seventh Ward—A. S. GAGE, M. D.

Eighth Ward—J. W. FRANCE, M. D.

Ninth Ward—H. Y. WESTBROOK, M. D.

Tenth Ward—J. F. HEMPEL, M. D.

Eleventh Ward—CLAUDE VAN BIBBER, M. D.

Twelfth Ward—T. L. RICHARDSON, M. D.

Thirteenth Ward—D. S. WILLIAMS, M. D.

Fourteenth Ward—A. G. BARRETT, M. D.

Fifteenth Ward—J. L. RIDGELY, M. D.

Sixteenth Ward—M. K. WARNER, M. D.

Seventeenth Ward—H. D. LEWIS, M. D.

Eighteenth Ward—R. A. WARNER, M, D.

Nineteenth Ward—M. G. SMITH, M. D.

Twentieth Ward—H. J. HAHN, M. D.

Twenty-First Ward—A. D. DRISCOLL, M. D.

Twenty-Second Ward—A. T. CHAMBERS, M. D.

Twenty-Third Ward—H. LEE FRANKS, M. D.

Twenty-Fourth Ward—L. J. TURLINGTON, M. D.

REPORT

— OF THE —

Commissioner of Health.

REPORT

SUB-DEPARTMENT OF HEALTH,
DEPARTMENT OF PUBLIC SAFETY,
CITY HALL ANNEX.

BALTIMORE, MD., January 1, 1903.

To the Honorable the Mayor and
City Council of Baltimore:

GENTLEMEN—In accordance with the requirements of law, I have the honor to submit the report of the Sub-Department of Health for the year ended December 31st, 1902. The death rate for the whole population, white and colored, was 19.53 per thousand, compared with 19.63 for 1901. The deaths included 4,072 white males, 3,661 white females; 1,274 colored males, and 1,246 colored females, a total of 10,253. The death rate per thousand of our white population was 15.32, while the death rate of our colored population was 31.50, more than double that of the white population. The births reported, returns incomplete, were: white males, 3,653; white females, 3,540; colored males, 874; colored females, 883; total 8,950. Still births, 659. The birth rate per thousand of population was: white, 16.17; colored, 21.96; for the entire population 17.05. It will be seen that while the death rate among the colored population was more than double that of the white population, the birth rate of the former was 26 per cent. greater than that of the latter. The deaths in public institutions were 1,885. 1,072 coroners' inquests and 83 official autopsies were held. Marriages reported, 5,135.

Smallpox.

It seems to me fitting at this time to refer you to the smallpox situation—past and present, so that you might fully appreciate the work of the Health Department in keeping the city free from the disease.

I claim that the record of only seventy-eight cases of smallpox, from January 1, 1899, to December 31, 1902, in a city consisting of 525,000 people, 80,000 of whom are negroes (who contract the disease more readily than whites), is a record that should give us great confidence in our ability to cope with the disease.

In order to show that our city has been exposed to danger for a number of years, I submit a list of States invaded by smallpox, as given in the weekly bulletins issued by the United States Marine Hospital Service, commencing January 1, 1898:

Alabama	January 1	Arkansas	March 1
North Carolina	" 12	New Jersey	" 4
South Carolina	" 15	New Mexico	" 5
Georgia	" 17	Louisiana	" 13
Florida	" 24	Ohio	April 8
Tennessee	" 24	Pennsylvania	" 13
Virginia	February 1	Illinois	May 4
Texas	" 2	New York	" 14
Kentucky	" 3	Wisconsin	" 19
Massachusetts	" 5	Colorado	June 24
Dist. Columbia	" 7	Kansas	September 15
Michigan	" 12	California	November 7
Mississippi	" 15	Iowa	" 26
West Virginia	" 15	Oklahoma	December 8
Indiana	" 26	Arizona	" 16

You will observe that during the year 1898 cases of smallpox were reported to be in thirty States and territories.

We were most concerned in the fact that the disease was menacing Baltimore, by the cases developed in Virginia,

West Virginia and Pennsylvania, especially by the migration of negroes. The health officials had now no doubt that Baltimore would soon be invaded; indeed, it is marvellous that a case of smallpox had not already been in the city.

To show still further the pandemic of smallpox, I will add the following from the United States Marine Hospital weekly reports, which shows the minimum number of cases.

The year 1899 added thirteen states to the above list. The grand total of cases for the year was 11,136. The year 1900 added five more States and territories, making forty-eight in all; the grand total number of cases for the year was 20,362. The year 1901 added one more to the list, making forty-nine States and territories infected, with a total number of cases for the year of 48,206. The year 1902 showed for the year 54,014 cases. During the four years we find every State and territory invaded.

SUMMARY.

Year.	Cases.
1899	11,136
1900	20,362
1901	48,206
1902	54,014
Total	133,718

The epidemic in Baltimore in 1882–'83 caused the Mayor and City Council to pass ordinances giving extraordinary powers to the Commissioner of Health in times of imminent danger from disease. Ordinances requiring all persons to be vaccinated, at least once before one year old, and afterward when deemed necessary by the Commissioner of Health, were passed. Physicians were paid by the city, year by year, to go carefully over every ward, to see that every one was vaccinated. How well the people had obeyed their own laws was soon to be demonstrated.

The first case of smallpox was reported to the Department in January, 1899, by the physician stationed at Fort McHenry. A suspicious eruption had appeared in a recruit (white man), who had just arrived from Rochester, N. Y., where he had enlisted. The eruption was not typical, but because it was believed that the man had been exposed to smallpox in Rochester, it was considered best to use the same precautions as in cases of smallpox. Very soon an undoubted case was reported by the United States Marine Hospital office on Lombard street, which was then in charge of Dr. George Purviance. This man had had an eruption for four days, during which time he had been in various resorts of Marsh Market Space. The Health Department at once transferred the patient to Quarantine, and on the same night, with police protection, visited all the dance houses (negro) in the Space, and in the immediate neighborhood. Nearly 500 persons were vaccinated. It was discovered that a large proportion of the negroes had never been vaccinated before.

When a case of smallpox was discovered, the people in the neighborhood were vaccinated, and the reports of the physicians in charge of the vaccination squads show that 25 per cent. to 75 per cent. of the people vaccinated by them had never before been vaccinated. The finding of seven cases of smallpox in one week, coupled with the above reports from the vaccine physicians, determined the Health Commissioner to order a general vaccination.

After one month's work the services of the thirty extra vaccine physicians were dispensed with, and the regular force of twenty two vaccine physicians continued the work in all parts of the city. In this we were ably assisted by the free dispensaries, which were supplied with virus by this department.

It was considered wise to fortify the city still further by requesting that the officers of the Post-Office Department and the Police Department be vaccinated. This was at once complied with.

As shown by the report of the department for 1899, over 60,000 were vaccinated by the officers of the department (fifty-two vaccine physicians and many dispensaries) during the month of March, and judging by the amount of virus sold during that time, as many more were vaccinated by private physicians:

TABLE OF CASES FOR FOUR YEARS.

Month.	Years.				
	1899.	1900.	1901.	1902.	Total.
January	2	..	3	..	5
February	2	..	1	14	17
March	7	..	4	3	14
April	2	9	1	3	15
May	3	2	2	5	12
June	..	3	1	..	4
July	1	1	..	1	3
August	..	1	..	..	1
September	..	..	..	2	2
October	..	..	..	..	..
November	..	..	..	..	1
December	1	1	1	1	4
Total	18	17	14	29	78

From time to time (as shown by the table) a case of smallpox would be discovered within the city, but the first real test of the degree of protection enjoyed by the citizens through vaccination was not given until March 28, 1899, when the department discovered a case of smallpox at 615 Wayne street. The case had developed in a young negro, who was a waiter or porter on one of the railroads. When first seen by the department officials he was in the last stage of desquamation; he was just recovering from a mild case of smallpox. This case had been diagnosed as a case of black measles, and every day,

with the exception of a couple of days previous to the eruption, he had been going about his portion of the city, and associated with many people. Fortunately, however, that section of the city had been "gone over" by the vaccinating squads three times before the case was reported. No case developed from it.

Perhaps the severest trial came in the last part of January and the first part of February, 1902. On January 24th, 1902, the steamship "Vedamore," of the Johnstone Line, arrived from Liverpool, England, which was a non-infected port. She came in with all hands well. On the way over, (about ten days out,) one of the cattlemen died of "peritonitis," as shown by the captain's book. On February 2d the Health Department received a message from the University of Maryland Hospital that there was a suspect in their wards. Upon investigation the suspicions of the physicians were found correct, and the colored patient, Benjamin Hawkins, was removed to quarantine. We ascertained from him that he was a cattleman from the steamship "Vedamore." He also told us about the dead man buried at sea. His description of the case, added to his own case, made us believe that the man who died at sea of "peritonitis" really had died of smallpox. We ascertained that owing to the fog and ice the steamship "Vedamore" had not sailed (as scheduled) that day; so we found her at Locust Point loaded with cattle ready to sail. All of the cattlemen who came over and landed January 24 had scattered. As the vessel had already been thoroughly cleaned up, we vaccinated the officers and crew, (about sixty-five), and allowed the vessel to go the next day. The cattlemen we looked for on the steamship "Vedamore," and found scattered, were found in the city in various places from February 3 to 11, as they developed smallpox. Seven men in all thus developed the disease, and they, while in the city, went about with their clothes undoubtedly infected, as they had not changed clothing since they had buried the man at sea. In spite, how-

ever, of all the exposure, there were but three cases developed from them. The first was found on February 17, (a white boy,) the second on February 22d, and the third on February 26; none of these had been vaccinated. The last two cases developed in men who had been in contact with the men of the steamship "Vedamore." This fact was discovered by the vaccination squads, and immediately the men were placed under guard in the detention house, situated in the centre of of the city, to await developments. The value of this house for the guarding and observing of men who have no homes in the city, and who had been exposed to possible infection, has been shown time and again. By this precaution seven cases of smallpox have been prevented from developing within the city, where they might have remained (in sailor boarding-houses, etc.,) for several days before detection, and thus produced many foci of infection.

It is highly gratifying to find that out of the seventy-eight cases handled by the Department less than a dozen cases were actually contracted within the city. It is also of great interest to note that every one of these patients had never been vaccinated, except George Wilson, (May 9), who had been vaccinated forty-five years ago.

We believe that the freedom from an epidemic of smallpox for four years by our city has been due:

First—To vaccination, which was begun long before cases had been contracted within the city, and persistently carried out during the entire time.

Second—To discovery of cases when the eruption had been out but a short time. In this we were well assisted by the patrolmen of our Police Department, who detected cases of suspicious eruption in people in the streets, and held them until inspected by the Health Department officials. In this way several cases of smallpox were found. The patrolmen's

services were especially good when they apprehended Edgar Stott, colored, about 1 A. M. February 11, 1902. This man had just arrived at Camden Station, he having been sent from a railroad camp, to where he had gone from the steamship "Vedamore." When he was seen that night by the Health Department officer, he showed an eruption about ten days old, the virulence of which is evidenced by the fact that four cases of smallpox developed in people (not citizens) who were in the same passenger coach with Edgar Stott, but no case was contracted in the city from him.

Third—To the quick removal to Quarantine of cases after diagnosis was sure.

Fourth—To re-vaccination of *all* people, not only in the house where the case developed, but also in houses in the neighborhood; also all people with whom the sick one came in contact with while he was going about the city.

Fifth—To the use of the detention house, where seven suspects developed smallpox.

Sixth—To the complete fumigation and cleansing of house, clothing, etc. This, in some instances, required destruction by burning.

Seventh—To the hearty co-operation of the physicians, who never hesitated to call upon the department for assistance in cases of disease showing eruption simulating smallpox.

Eighth—And by no means the least, to the department concealing nothing from the daily press. Our papers kept the people well posted of exactly what was occurring. The evidence thus produced doubtless caused many people to be vaccinated by their physicians, when advised to do so by the department through the papers.

I also believe that in addition to the above eight factors concerned in preventing an epidemic of smallpox, we have been greatly assisted by the excellence of the work of our State Board of Health, through its secretary, Dr. John S. Fulton. By his work, coupled with local health officers, outbreaks in various portions of the State have been well handled, and cases of smallpox have been prevented from wandering into the city. The city has helped some in this work, by opening our Quarantine Hospital for the reception of cases that could not well be cared for otherwise.

We are prompted to present the above account of smallpox in this city, not by a spirit of vain boasting, but to show what can be done when the people work in harmony with their Health Department. We know that we are by no means out of danger (because smallpox is yet abundant elsewhere,) yet we feel more than ever confident that there is no possibility of an epidemic of smallpox, even of small proportions, in this city, if the citizens are vaccinated once successfully, and re-vaccinated when advised to do so by the health officials.

Attention is called to some observations of Dr. William Royal Stokes, Bacteriologist of the Health Department, on the pathology of smallpox, and the accompanying micro-photographs obtained from cases treated at the Quarantine Hospital, published elsewhere in this report.

General Sewerage.

I desire to repeat and emphasize the recommendations made in former reports of the necessity of an adequate sewer system for Baltimore. That the need of such a system has not been more apparent in the past is very largely due to the topography of our city. Built on rolling land, storm water is easily carried off, and it carries with it a large amount of filth that otherwise would accumulate in the gutters. This storm water, however, acts only on the surface, and can have no effect on

the soil which has become impregnated with organic matter from the 90,000 or more earth closets with which Baltimore is cursed. While it is true that the streets are, in a measure, cleaned by every heavy fall of rain, it by no means takes away from the city the overflow from earth closets and other unhealthful matter. Nearly all of our principal sewers, as well as the surface flow, empty into the harbor, which serves as a reservoir to store up this matter, and whenever dredging is done, or vessels enter or leave the harbor, the solid matter is stirred up from the bottom, creating a stench that is well nigh unbearable. Another important point in considering the disposal of sewage matter is the liability of the transmission of disease by flies and mosquitoes. It is well known that flies swarm wherever there is refuse matter undergoing decomposition. The earth closets being in every case close to the dwelling-house, it is evident that there is great danger of poison being carried by flies. That mosquitoes breed wherever there is a collection of stagnant water is well demonstrated, and they are numerous near cess-pools. Scientific observers have conclusively shown that mosquitoes are active agents in the transmission of disease, and that if malaria is to be obliterated from large cities the mosquito must be prevented from breeding. As long as these cess-pools are permitted to exist it will be impossible to exterminate them.

During the year there were 220 deaths from typhoid fever, an increase of 79 over the preceding year. While it may be said that this is not a large number for a city the size of Baltimore, I believe that with a proper sewer system the death rate from this cause would be lessened considerably.

In this connection I desire to call attention to the importance of dredging Jones' Falls from its mouth to Hillen street. Flowing as it does through a thickly built up section of the city, the stream is little more than a sewer, discharging its contents into the harbor. There is but a slight flow of the tide, and the result is the accumulations of hundreds of tons of de-

composing refuse matter at the mouth of the stream. This is not only injurious to health, but in warm weather the odor arising from this mass is unendurable. Powerful disinfectants have been poured into the stream at Hillen street, only to afford temporary relief.

The Prevention of Breeding of Mosquitoes.

As stated above, it is recognized that the mosquito is the most important agent by which malaria is transmitted. It has been shown that this is a matter no longer capable of dispute. Careful investigations have shown that drainage and the free use of petroleum will put a stop to the breeding of mosquitoes. This was conclusively demonstrated at Havana, where yellow fever was eradicated by the drainage of all ponds and pools of water, the removal of empty barrels, cans, bottles and other vessels that might contain stagnant water, and the liberal use of petroleum in cess-pools and other places where they would naturally breed. Good results have been obtained in New York and other cities by the same methods, and wherever attempted it was shown that the mosquito was either obliterated or so reduced in numbers as to justify the expenditure.

Cow Stables in the City.

I am gratified to be able to report the adoption by the Mayor and City Council of an ordinance to regulate the keeping of milch cows within the city limits. This ordinance, a copy of which is appended, was approved May 13, 1902, but did not become effective until July 1st succeeding. It was too late in the year to deduce any satisfactory conclusions as to its value in lessening the death rate in young children, but another year I believe will show a decided decrease in the number of deaths from diarrhoeal diseases. At the time of the adoption of the ordinance there were 394 cow stables

within the city limits, containing 1,984 cows. When the ordinance became operative 107 stables, containing 1,496 cows, were closed. The terms of the ordinance had little or no effect on the cow stables located in the annexed portions of the city where there is sufficient space for pasturage and exercise, but it has a salutary effect there, as well as elsewhere, in compeling dairymen to keep their stables clean, well ventilated and properly lighted. The principal effect of the ordinance and its value to consumers of milk was in the more congested sections of the city, where a large number of stables were closed that in the nature of things could only produce milk unfit for human consumption. These stables were located in small back yards. They were dark, badly ventilated, and in many cases filthy. There was no place for the cows to graze or obtain needed fresh air and exercise, and many of them were kept in filthy stalls until they went dry and were sold for beef. By the removal of stables of this description it is hoped that the children of the poor will be enabled to have a purer article of milk than they have had heretofore, with a consequent reduction in infant mortality. The following is the full text of the ordinance:

AN ORDINANCE REGULTING THE KEEPING OF COWS IN THE CITY OF BALTIMORE, AND TO PROVIDE PENALTIES FOR THE VIOLATION OF THE SAME.

SECTION 1. Be it ordained by the Mayor and City Council of Baltimore, That from and after July 1st, 1902, it shall not be lawful for any person or persons to keep or possess within the corporate limits of Baltimore City any cow or cows, either for the conduct of the dairy business or for his or her personal use, unless and except such cow or cows shall be stabled on, or located and kept in and upon ground of not less than one-quarter acre in area, all of said area not occupied by the stable to be accessible to said cows, and set apart for them for exercise and fresh air; and upon the further express condition precedent, that a permit shall have first been obtained from the Health Commissioner permitting such cow or cows to be located within the corporate limits of the City of Baltimore as by this ordinance prescribed, which permit must designate upon its face specifically the location for the keeping of such cow or cows. The violation

of any of the regulations and restrictions of this section shall subject the person or persons violating to a fine of not more than twenty dollars ($20.00) or less than five dollars ($5,00), and a further fine of one dollar ($1.00) for each day that the violation is continued after notice is given to discontinue.

Sec. 2. Be it further ordained, That it shall be unlawful for any person or persons to keep more than eight cows on each such area of one-quarter acre of ground; any person or persons violating this section shall be subject to a penalty of not more than twenty dollars ($20.00) or less than five dollars ($5.00), and one dollar ($1.00) per day additional for each day that the offense is continued after notice is given to discontinue said violation, and such permits to be revocable by the Health Commissioner whenever said cow stables are not kept in good hygienic and sanitary condition.

Sec. 3. And be it further ordained, That wherever under this ordinance cows may be kept, pasturage must be provided for them. Any person or persons violating this section shall be subject to a penalty of not more than twenty dollars ($20.00) or less than five dollars ($5.00), and one dollar ($1.00) per day additional for each day that the offense is continued after notice is given to discontinue said violation.

Sec. 4. And be it further ordained, That the owners of cows that may be kept within the city limits under this ordinance, shall register with the Health Department the place where said cows are kept; and the Health Department shall keep a complete register thereof. Failure on the part of the owners or possessors to register the place of their keeping shall subject such persons to a penalty of not more than twenty dollars ($20.00) or less than five dollars ($5.00).

Sec. 5. And be it further ordained, That the fines, forfeitures and penalties prescribed in this ordinance shall be collected as all other fines, forfeitures and penalties are now collected.

Sec. 6. The Health Commissioner shall, however, issue annual permits to persons desiring to keep not more than four cows on unimproved lots of less than one-fourth acre, but not less than one-eighth acre in area, providing said stable or stables have floors of cement or other non-absorbent material, and have windows on at least two sides, giving three square feet of window space for each animal, and stables to have air space in that part occupied by the animals of one and a half cubic foot for every pound live weight of the animals kept therein. And provided further, that said stables have all other necessary equipment and appliances for securing absolutely perfect and sanitary hygienic condition.

Sec. 7. And be it further ordained, That that part of Section First regulating the size of the lot on which cows may be kept within the corporate limits of the City of Baltimore, shall not apply to stables in which cows

are temporarily kept for sale or exchange only, provided said stables have floors of cement or other non-absorbent material, and have windows on at least two sides giving three square feet of window space for each animal, and stables to have air space in that part occupied by the animals of one and a half cubic feet for every pound live weight of the animals kept therein. And provided further, that said stables have all other necessary equipment and appliances for securing absolutely perfect and sanitary hygienic condition.

Sec. 8. Nothing in this ordinance shall be construed as repealing any ordinances, rules and regulations now existing for compelling perfect hygienic and sanitary condition of all cow stables within the corporate limits of the City of Baltimore.

Approved May 13, 1902.

Thomas G. Hayes, *Mayor.*

A True Copy, May 14, 1902.

George N. Numsen, *Register.*

Hospital for Minor Infectious Diseases.

It is a matter of regret that but little progress was made during the year toward the establishment of a hospital for minor infectious diseases, viz: scarlet fever, diphtheria and measles. The Mayor and City Council had appropriated $25,000, and directed the sale of the Old Quarantine grounds and the Eastern Potters Field, the proceeds on which to be devoted to the purchase of a site and the construction of a hospital. A commission consisting of his Honor the Mayor, William H. Welch, M. D., I. E. Atkinson, M. D., John W. Chambers, M. D., John D. Blake, M. D., James Bosley, M. D., and Mr. F. X. Donnelly, was created to purchase a site and construct a hospital. After carefully examining several tracts of land the commission decided to purchase a lot of ten acres of ground situated on the Reisterstown turnpike, known as the Three Mile House. Unfortunately persons residing in the neighborhood objected to the establishment of such a hospital on the site selected, and by legislation had at Annapolis effectually prevented the construction of an infectious disease

hospital inside the city limits without the consent of the Mayor and City Council. The site was therefore abandoned and nothing further was accomplished. Later in the year a tract of 147 acres of land adjoining Bay View Asylum was acquired by the city for the use of that institution, with the understanding that about forty acres of the tract will be set aside, upon which to construct a hospital for the care of persons suffering with the minor infectious diseases. There is a mistaken impression in the minds of many persons that the hospital is to be used for the care of persons suffering with smallpox. There is no occasion for uneasiness on this score, as all cases of smallpox are treated at Quarantine, where ample facilities have been prepared.

Repaving and Repairing Alleys.

The condition of many of the alleys with which Baltimore is abundantly supplied is often a menace to the health of the city. The cobblestones used for paving these alleys soon become displaced by heavy wagons and carts, and the alleys are filled with ruts and holes which form receptacles for decomposing filth. With improved pavements the alleys could be kept comparatively clean with little effort. Great difficulty has been experienced in requiring property owners to regrade and repave alleys when directed to do so by the Health Department, and in several instances the aid of the courts had to be invoked to enforce a compliance with the law. It was found that in most cases where regrading and repaving were necessary, the abutting property owners preferred that the work be done under the supervision of the City Engineer, the cost to be assessed against the owners. There was not sufficient legal authority for this method, and for that and other reasons a bill was introduced in the last General Assembly authorizing the Commissioner of Health, whenever necessary, to have such regrading and repaving done by the City Engineer at the expense of the abutting owners. The bill was reported favorably by committee, but failed of passage.

Inspection of Food.

Careful attention was given to the character and quality of food offered for sale in the markets and stores. Two inspectors devoted their entire time to an examination of the milk supply, inspecting it first at the railway stations where it was received from the shippers, and later at dairies and stores and in the distributing wagons. During the year 33,503 lots of milk, containing 1,770,299 gallons, were examined, and 557 lots, containing 2,944 gallons, were condemned and spilled. One inspector was constantly engaged at the abbatoirs and slaughter-houses, who condemned a large number of cows and steers, suffering with lump jaw and tuberculosis. Another inspector made daily visits to the markets, stores and cold-storage houses, resulting in the condemnation of thousands of pounds of poultry, fish, crabs, vegetables, fruits, etc. Still another inspector made daily visits to the wharves to inspect food products coming into the city by water. The condemnation in 1901 of tons of sophisticated sausage sent here by western packers was a sufficient warning that such products could not be sold in Baltimore, and served to keep that character of food away from the city. For a detailed statement of the work in this line reference is made to the reports of the Bacteriological and Chemical Laboratories.

Inspections of Plumbing and Drainage.

The work of the Division of Plumbing and Drainage was kept up to the high standard it attained when the force of inspectors was increased. Many unsanitary conditions were brought to light and corrected.

Disinfection and Fumigation.

Valuable service was rendered the city by the fumigation of houses infected with contagious diseases. The aim of the department is to fumigate premises as soon as possible, and so

effectually that all disease germs will be destroyed. Particular attention was given to the fumigation of houses infected with tuberculosis, and the department will take pleasure in fumigating such houses upon the request of physicians. During the year seventeen barrels, the equivalent of 85,000 gallons, of disinfectants were distributed.

Quarantine Station.

I desire to call attention to the report of Dr. Sydney O. Heiskell, Assistant Commissioner of Health at Quarantine, accompanying this report. By careful and economical management Dr. Heiskell, while performing his manifold duties in a most conscientious manner, has so reduced the expenses of the station that the cost was but little in excess of the revenue derived from the inspection of vessels entering the port. I heartily concur in the recommendation of Dr. Heiskell for the construction of a barracks at the Quarantine Station for the detention of suspects.

Respectfully submitted.

JAMES BOSLEY, M. D.,
Commissioner of Health.

REPORT REGISTRAR OF VITAL STATISTICS.

REPORT.

JANUARY 1, 1903.

JAMES BOSLEY, M. D.,
Commissioner of Health.

DEAR SIR:

I have the honor to submit my report of the Registrar of Vital Statistics for the year ended December 31, 1902.

In summing up the work of this division I desire to direct your attention to the accumulated mass of matter to be recorded when I was placed in charge in February, 1900. The division was created in 1875.

The Record of Deaths.—The certificates of death were recorded to date, but the indexes to the same ceased August 31, 1893.

The Record of Births.—The returns of births were recorded up to November, 1899, but the indexes ceased in August, 1881.

You will see that there were nearly seven years of death records that had not been indexed, aggregating 72,475 names. The indexes to the returns of births had not been given attention for nearly 19 years, aggregating 142,500 names, while the returns of births had not received attention from November, 1899, to February, 1900, numbering about 2,500 returns. In addition, I found several hundred returns of births filed among the recorded papers that had not been recorded, and several hundred names indexed under the wrong initial.

From the creation of this division until February, 1900, the work was performed by three officers—a Registrar's Clerk, whose duty was to register certificates of death, issue transcripts of the records, furnish the Supervisors of Elections with monthly lists of dead adults, and attend to the wants of the public having business with the division; a Recorder of Births and an Index Clerk.

From February, 1900, to January 1, 1902, all of this work devolved upon one man. During that period the recording of certificates of death was kept up to date, numerous letters of inquiry from out of town persons replied to, many errors that had accumulated from the inception of the division corrected, considerable indexing was accomplished, and all papers filed for safe keeping.

In the latter part of 1900 it became apparent that some radical change was necessary, due to the time lost in searching records that had not been indexed, and acting upon the suggestion of the Secretary of the Department, the recording of deaths was temporarily abandoned, and the time required for that work devoted to indexing the current certificates and much of the accumulated indexing. In March, 1901, a new system of indexing was adopted, which greatly facilitates the examination of the records.

In 1902 there were indexed, folioed and filed 10,253 certificates of death, while the returns of births were numbered and filed. Four hundred and thirty transcripts from the record of deaths and 6 transcripts from the record of births were issued. The Board of Election Supervisors were furnished monthly lists of deceased voters, in order that their names might be stricken from the registration lists. In addition to this it was necessary to handle a list of 570 names of persons, said to have died in Baltimore, that was submitted by the United States Census Office, with the claim that they did not appear upon our records. About one-half of these names were looked up, and it was found that the apparent discrepancy was due to

the deaths of residents of Baltimore in other cities, and a difference in the spelling of names. At intervals in the above work about 6,000 returns of births were indexed, but not recorded.

In January, 1902, an additional recorder was appointed (Mr. C. A. Wall, Jr.), who indexed 72,450 names, bringing the indexes to the record of deaths up to date, and recorded 4,500 certificates of death, covering the period from March, 1901, to August, 1901.

At present there are to be recorded 14,211 certificates of death, from August, 1901, to December 31, 1902, (these have been indexed), about 16,000 certificates of birth, covering the period from November, 1899, to December 31, 1902, and the indexing of the same, and the indexing of the returns of births from 1883 to 1899, making a total of about 152,000 returns of births to be indexed.

In conclusion I beg to call your attention to the importance of these records, which are constantly being referred to by lawyers and others to establish proof of deaths or births. For that reason they should speedily be brought up to date, and I respectfully recommend the appointment of at least one more recorder, and suggest that some means be adopted to enforce the law providing for the prompt return of births by physicians and midwives.

Respectfully submitted.

JOHN H. UHLENBERG,
Registrar's Clerk.

TABLES.

VITAL STATISTICS OF THE CITY OF BALTIMORE FOR THE YEAR ENDING DECEMBER 31, 1902.

Estimated population, white			445,000
" " colored			80,000
Total			525,000
Marriages reported			5,133
Rate per 1,000 population			9.78
Births reported, white males	3,653		
" white females	3,540		
		7,193	
" colored males	874		
" colored females	883		
		1,757	
Total births reported		8,950	
Birth rate per 1,000 population, whole			17.05
" " " white			16.17
" " " colored			21.96
Still births			659
Total mortality, white males	4,072		
" white females	3,661		
		7,733	
" colored males	1,274		
" colored females	1,246		
		2,520	
Total deaths reported		10,253	
Annual death rate per 1,000 population, whole			19.53
" " " " less non-residents			18.70
" " " " white			16.16
" " " " less non-residents			15.32
" " " " colored			31.50
" " " " less non-residents			30.76

Total number of deaths from measles	41
" " " scarlet fever	37
" " " diphtheria and croup	130
" " " whooping cough	95
" " " typhoid fever	220
" " " diarrhœa and enteritis	82
" " " dysentery	78
" " " infantile diarrhœa and cholera infantum	695
" " " tuberculosis of the lungs	1,159
" " " pneumonia	1,010
" " " bronchitis	241
" " " influenza	28
" " " Bright's disease	659
" " " cancer	384
" " " diseases of the heart	716
" " " sunstroke and heat exhaustion	9
" " " anaemia	25
" " " accidents	416
" " " puerperal fever	62
" " " " convulsions	18
" " " " hemorrhage	13
Total mortality under five years of age	3,327
" from diarrhœal diseases, under five years of age	695
" " " all ages	855

Deaths in Public Institutions.

Baltimore City Jail	9
Penitentiary	20
Hospitals and asylums	1,856
Total	1,885
Number of coroners' inquests	1,072
" autopsies	83
" non-residents dying in the city, white	376
" " " " colored	59

TABLE No. I.

Showing the Number of Infectious and Contagious Diseases Reported During the Year 1902.

Diseases.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Smallpox	.....	14	3	3	5	.....	1	.....	2	.....	.....	1	29
Diphtheria	86	80	88	61	40	26	39	59	77	143	125	117	941
Pseudo-membranous croup	5	.....	.....	1	2	.....	.....	.....	1	6	8	8	31
Scarlet fever	28	45	36	32	49	45	40	29	49	56	45	27	481
Typhoid fever	29	17	20	30	33	40	61	206	317	216	69	48	1,086
Measles	20	30	29	51	62	104	86	29	23	100	416	959	1,909
Mumps	7	8	10	3	5	3	4	5	4	5	2	15	71
Whooping cough	35	14	37	63	41	58	39	44	18	12	18	16	395
Varicella	39	28	30	29	27	11	2	3	4	2	17	39	231
Tuberculosis pulmonalis	27	24	36	35	34	19	25	19	37	35	36	29	356
Total	276	260	289	308	298	306	297	394	532	575	736	1,259	5,530

TABLE No. II.

Showing the Number of Deaths according to Ages During the year 1902.

Ages.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Under 1 year.....	156	151	168	144	156	254	407	317	233	171	123	169	2,449
Between 1 and 2 years..	37	44	28	33	32	41	59	45	39	24	35	49	466
" 2 and 5 " ..	41	29	40	30	28	34	40	24	24	28	47	47	412
Total under 5 years.	234	224	236	207	216	329	506	386	296	223	205	265	3,327
Between 5 and 10 years	17	11	24	17	25	24	17	19	15	15	23	26	233
" 10 and 15 "	11	9	12	11	13	17	18	20	13	10	16	18	168
" 15 and 20 "	19	14	23	25	19	23	29	31	30	20	29	23	285
" 20 and 30 "	87	66	84	91	79	81	69	78	89	71	59	68	922
" 30 and 40 "	87	87	74	73	71	81	65	69	71	81	63	72	894
" 40 and 50 "	96	76	95	71	93	74	80	84	71	75	71	96	982
" 50 and 60 "	107	85	98	103	87	68	75	54	79	65	69	110	1,000
" 60 and 70 "	114	115	96	100	99	79	82	74	78	85	92	113	1,127
" 70 and 80 "	94	85	70	78	66	65	78	69	52	61	60	97	875
" 80 and 90 "	38	31	32	46	30	30	28	29	15	32	32	36	379
" 90 and 100 "	8	12	5	7	5	3	4	2	2	4	1	3	56
" 100 and 110 "	.....	1	.....	.....	.....	.....	1	.....	1	.....	.....	1	4
Unknown	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Total.....	912	816	849	829	804	874	1,052	915	812	742	720	928	10,253

TABLE No. III.

Showing the Number of Deaths According to Ages, Sex and Color During the Year 1902.—Whites.

Ages.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Under 1 year	59	50	51	62	62	56	60	36	57	49	95	85	172	133	129	115	94	81	70	53	50	40	68	47	1,774
Between 1 and 2 years	15	10	15	13	8	9	13	8	12	7	16	15	17	33	17	25	15	13	8	7	10	17	26	11	340
" 2 " 5 "	16	11	8	8	11	12	6	7	10	5	15	11	21	14	10	9	12	5	11	5	20	15	20	17	279
Total under 5 years	90	71	74	83	81	77	79	51	79	61	126	111	210	180	156	149	121	99	89	65	80	72	114	75	2,393
Between 5 and 10 years	2	9	7	3	6	11	6	3	3	9	9	12	13	3	11	2	5	7	5	8	11	8	9	8	170
" 10 " 15 "	1	8	3	3	2	5	2	4	2	4	6	3	10	4	9	5	4	5	2	7	7	5	5	9	115
" 15 " 20 "	6	8	4	1	6	10	6	8	1	12	5	8	16	7	10	7	10	10	7	9	14	8	11	7	192
" 20 " 30 "	32	32	28	22	29	28	34	35	26	21	20	25	24	21	25	35	23	34	31	19	17	27	24	20	632
" 30 " 40 "	35	23	39	26	31	19	34	25	23	28	31	22	23	26	31	25	25	21	33	24	27	21	30	18	640
" 40 " 50 "	43	34	28	24	38	33	34	21	47	24	23	27	28	31	38	22	38	14	31	21	28	24	45	24	720
" 50 " 60 "	53	31	38	28	39	36	40	36	37	30	23	27	28	25	24	14	34	24	25	26	29	23	43	38	751
" 60 " 70 "	46	44	54	45	40	38	46	35	56	30	36	34	39	30	35	28	33	36	43	31	51	31	52	41	954
" 70 " 80 "	33	52	29	46	23	40	37	33	33	29	33	23	32	37	17	48	17	28	22	32	25	26	45	46	786
" 80 " 90 "	16	16	9	13	12	18	14	25	8	22	11	15	12	14	9	17	4	9	15	15	18	14	13	19	338
" 90 " 100 "	.....	4	2	7	.....	3	2	4	1	2	.....	1	1	2	1	1	.....	2	1	3	.....	1	1	1	40
" 100 " 110 "	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Total	357	332	315	302	307	318	334	280	317	272	323	308	436	381	366	353	314	289	304	260	307	260	392	306	7,733

TABLE No. IV.

Showing the Number of Deaths According to Ages, Sex and Color During the Year 1902.—Colored.

Ages.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Under 1 year	27	20	22	16	28	22	26	22	33	17	36	38	63	39	40	33	33	25	27	21	17	16	27	27	675
Between 1 and 2 years	5	7	8	8	9	2	8	4	5	8	6	4	6	3	1	2	8	3	5	4	5	3	4	8	126
" 2 " 5 "	4	10	5	8	9	8	10	7	7	6	6	2	3	2	2	3	4	3	9	3	5	7	6	4	133
Total under 5 years	36	37	35	32	46	32	44	33	45	31	48	44	72	44	43	38	45	31	41	28	27	26	37	39	934
Between 5 and 10 years	4	2	1	....	1	6	2	6	3	10	1	2	.....	1	2	4	1	2	1	1	2	2	3	6	63
" 10 " 15 "	1	1	.....	3	2	3	2	3	5	2	4	4	.....	4	3	3	2	2	1	.....	.....	4	1	3	53
" 15 " 20 "	2	3	3	6	1	6	3	8	1	4	5	5	3	3	4	10	4	6	1	3	4	3	2	3	93
" 20 " 30 "	12	11	5	11	15	12	8	14	13	19	21	15	14	10	7	11	23	9	8	13	8	7	10	14	290
" 30 " 40 "	15	14	13	9	10	14	6	8	11	9	15	13	8	8	4	9	13	12	9	15	10	5	9	15	254
" 40 " 50 "	9	10	13	11	14	10	9	7	13	9	12	12	7	14	9	15	9	10	12	11	9	10	12	15	262
" 50 " 60 "	14	9	13	6	11	12	18	9	11	9	9	9	13	9	8	8	9	12	11	3	11	6	20	9	249
" 60 " 70 "	13	11	12	4	10	8	8	11	6	7	5	4	4	9	5	6	3	6	7	4	4	6	10	10	173
" 70 " 80 "	2	7	4	6	3	4	2	6	2	2	2	7	2	7	1	3	3	4	3	4	2	7	2	4	89
" 80 " 90 "	2	4	6	3	.....	2	1	6	.....	.....	.....	4	.....	2	2	1	2	.....	.....	2	.....	.....	3	1	41
" 90 " 100 "	2	2	.....	3	1	1	.....	1	1	1	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	1	16
" 100 " 110 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	2
Unknown age	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Total	112	111	105	94	114	110	103	112	112	103	122	121	124	111	88	108	114	95	94	84	77	76	109	121	2,520

TABLE No. V.

Showing the Nativity of the Decedents for the year 1602.

Nativity.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
United States—White males	273	234	232	233	230	257	364	297	259	238	224	294	3,135
" White females	252	229	245	210	211	243	307	285	227	196	202	223	2,830
Foreign—White males	83	79	72	97	86	64	72	67	53	65	83	95	916
" " females	80	73	72	70	61	65	74	68	60	64	58	83	828
Colored males	109	105	113	102	109	120	124	88	112	93	76	108	1,259
" females	110	94	109	112	101	120	110	108	95	84	76	118	1,237
Unknown white males	1	2	3	4	1	2	.....	2	2	1	.....	3	21
" " females	.....	.....	1	.....	.....	.....	.....	.....	2	.....	.....	.....	3
" colored males	3	.....	1	1	3	2	.....	.....	2	1	1	1	15
" " females	1	.....	1	.....	2	1	1	.....	.....	.....	.....	3	9
Total	912	816	849	829	804	874	1,052	915	812	742	720	928	10,253

Showing the Number of Marriages During the Year 1902.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Marriages	381	356	328	484	293	601	327	328	478	560	546	451	5,133

TABLE No. VI.

Showing the Number of Births Reported During the Year 1902.

Color and Sex.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
White males	330	279	297	272	262	242	291	362	344	323	346	305	3,653
" females	308	295	292	269	254	247	315	304	315	288	347	306	3,540
Colored males	55	75	79	86	59	48	108	73	81	69	64	77	874
" females	84	79	70	73	53	54	83	57	88	61	97	84	883
Total	777	728	738	700	628	591	797	796	828	741	854	772	8,950
Illegitimates.													
White males	10	15	4	4	13	16	15	12	19	19	19	14	160
" females	11	8	12	15	15	18	13	10	14	16	18	16	166
Colored males	16	15	21	21	19	13	25	7	17	24	23	27	228
" females	20	20	10	27	12	19	18	5	26	21	26	21	221
Total	57	58	47	67	59	66	71	34	76	80	86	78	779
Still Births.													
White males	21	29	15	21	27	21	31	20	22	27	13	15	262
" females	16	11	12	23	22	15	18	10	15	20	8	18	188
Colored males	10	12	3	7	16	8	10	6	9	8	5	14	108
" females	12	12	11	3	9	7	7	8	8	6	7	11	101
Total	59	64	41	54	74	51	66	44	54	61	33	58	659

TABLE No. VII.

Showing the Number of Deaths Reported During the Year 1902 in Monthly Periods—Sex, Color and Nativity.

Months.	Native White.			Foreign White.			White.			Colored.			Totals.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
January	273	252	525	83	80	163	U'n 1 356	332	689	U'n 3 109	U'n 1 110	223	469	443	912
February	234	229	463	79	73	152	U'n 2 313	302	617	105	94	199	420	396	816
March	232	245	477	72	72	144	U'n 3 304	U'n 1 317	625	U'n 1 113	U'n 1 109	224	421	428	849
April	233	210	443	97	70	167	U'n 4 330	280	614	U'n 1 102	112	215	437	392	829
May	230	211	441	86	61	147	U'n 1 316	272	589	U'n 3 109	U'n 2 101	215	429	375	804
June	257	243	500	64	65	129	U'n 2 321	308	631	U'n 2 120	U'n 1 120	243	445	429	874
July	364	307	671	72	74	146	436	381	817	124	U'n 1 110	235	560	492	1,052
August	297	285	582	67	68	135	U'n 2 364	353	719	88	108	196	454	461	915
September	259	227	486	53	60	113	U'n 2 312	U'n 2 287	603	U'n 2 112	95	209	428	384	812
October	238	196	434	65	64	129	U'n 1 303	260	564	U'n 1 93	84	178	398	344	742
November	224	202	426	83	58	141	307	260	567	U'n 1 76	76	153	384	336	720
December	294	223	517	95	83	178	389	306	698	U'n 1 108	U'n 3 118	230	501	427	928
Total	3,135	2,830	5,965	916	828	1,744	4,072	3,661	7,733	1,274	1,246	2,520	5,346	4,907	10,253

TABLE No. VIII.

Showing the Number of Deaths According to Wards During the Year 1902.

Wards.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
First	29	32	31	25	21	32	46	49	26	31	26	38	386
Second	33	35	34	28	38	36	53	46	31	42	31	41	448
Third	35	32	34	25	32	45	48	44	37	30	32	32	426
Fourth	61	55	61	62	68	38	63	41	49	43	50	61	652
Fifth	32	31	34	29	44	39	48	41	21	23	29	31	402
Sixth	35	34	22	27	33	27	40	46	41	31	38	45	419
Seventh	46	50	35	49	38	45	57	36	38	36	37	57	524
Eighth	32	21	33	28	23	28	42	34	38	25	30	33	367
Ninth	32	22	25	27	29	25	28	26	28	31	23	30	326
Tenth	37	32	30	26	42	48	56	37	32	29	33	38	440
Eleventh	25	37	44	37	22	34	43	24	28	40	28	38	400
Twelfth	34	32	34	34	35	33	38	35	33	27	27	42	404
Thirteenth	33	23	29	31	17	22	34	23	19	16	24	31	302
Fourteenth	63	53	53	50	59	58	53	59	50	60	33	47	638
Fifteenth	24	20	27	33	35	25	30	35	35	25	21	34	344
Sixteenth	42	42	27	31	30	26	38	27	26	23	22	42	376
Seventeenth	55	40	28	33	33	34	39	39	38	25	28	41	433
Eighteenth	46	34	46	43	30	29	33	40	35	33	30	37	436
Nineteenth	34	34	30	39	29	46	45	33	31	31	31	28	411
Twentieth	24	21	34	27	22	29	37	26	21	21	22	24	308
Twenty-first	25	32	30	23	25	40	49	43	31	23	28	33	382
Twenty-second	42	30	37	45	37	27	45	36	33	31	33	33	429
Twenty-third	36	16	34	21	22	39	38	25	36	14	29	22	332
Twenty-fourth	32	25	24	22	22	39	30	41	28	30	17	38	348
Bay View Asylum	25	33	33	34	18	30	19	29	27	22	18	32	320
Total	912	816	849	829	804	874	1,052	915	812	742	720	928	10,253

TABLE No. IX.

Showing the Number of Deaths in Hospitals, Public Institutions, Inquests, etc., for the Year 1902.

Hospitals, Institutions, Etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Hospitals—Resident, white	64	60	56	54	55	49	47	64	53	58	45	55	660
" " colored	22	9	29	15	29	21	18	13	23	26	16	28	249
" Non-resident, white.	19	23	25	23	30	25	35	21	25	28	33	34	321
" " colored	1	3	5	7	3	5	4	7	11	1	2	3	52
Other Institutions, Asylums, etc.													
Resident, white	28	34	17	34	39	41	44	43	30	39	33	29	411
" colored	7	9	9	12	15	4	11	5	13	4	2	10	101
Non-resident, white	6	2	1	3	5	7	6	7	4	4	6	4	55
" colored	.....	.....	.....	.....	.....	2	.....	.....	2	2	1	.....	7
Jail	1	.....	.....	1	.....	1	1	1	1	2	.....	1	9
Penitentiary	1	1	.....	2	2	4	4	.....	2	3	.....	1	20
Total	149	141	142	151	178	159	170	161	164	167	138	165	1,885
Coroners' inquests	102	84	97	101	85	95	107	94	61	85	77	84	1,072
Autopsies	8	6	8	10	11	8	7	6	4	6	5	4	83

TABLE No. X.

Showing the Number of Deaths according to Occupations During the Year 1902.

Months.	Attorneys.	Bakers.	Blacksmiths.	Bookkeepers and Clerks.	Bricklayers.	Butchers.	Carpenters.	Cigarmakers.	Drivers.	Druggists.	Electrical Workers.	Engineers.	Firemen.	Housewives.	Jewelers and Watchmakers.	Laborers.	Laundresses.	Liquor Dealers.	Machinists.	Moulders.	Nurses.	Painters.	Paperhangers.	Planing Mill Workers.	Physicians.	Policemen.	Printers and Engravers.	Saloonkeepers.	Seamstresses.	Steam Railway Employes.	Street Railway Employes.	Shoemakers.	Stonecutters.	Servants.	Tailors.	Tinners.	All others.	Not Specified.	Total.
January	3	2	4	24	4	4	8	2	9	.....	.....	8	.....	140	.....	81	7	1	4	3	5	4	.....	2	1	5	6	6	9	5	.....	14	3	31	4	1	90	422	912
February	3	1	4	16	1	1	7	3	9	.....	.....	4	1	132	1	73	5	.....	6	1	3	8	.....	1	5	.....	.....	4	.....	2	2	4	.....	25	9	7	90	385	816
March	1	1	2	21	2	5	7	3	5	.....	.....	2	1	116	.....	96	14	.....	3	2	.....	3	1	.....	1	4	2	6	5	3	3	1	1	34	7	4	87	406	849
April	3	3	3	17	2	3	9	8	16	1	1	3	3	114	1	69	7	.....	7	1	1	4	.....	.....	1	3	4	5	6	3	3	1	3	40	11	3	93	375	829
May	2	2	3	20	2	2	13	5	4	.....	1	4	2	109	1	76	6	.....	3	1	3	8	1	.....	2	6	.....	3	5	2	2	3	6	37	12	3	88	371	804
June	1	1	1	21	3	1	9	2	16	.....	.....	1	.....	100	.....	63	11	.....	.....	.....	1	8	1	1	2	6	1	7	6	1	2	1	1	42	7	2	64	485	874
July	2	2	3	22	3	2	10	3	5	.....	1	2	3	120	.....	68	7	2	6	2	.....	9	.....	2	2	5	2	5	3	1	2	8	2	32	2	5	55	654	1,052
August	2	1	2	14	2	.....	6	4	7	.....	1	3	1	113	.....	56	8	.....	5	2	3	5	.....	.....	2	6	1	5	6	2	1	8	.....	25	5	1	71	548	915
September	2	3	4	22	4	3	5	1	11	1	2	1	.....	127	.....	74	3	.....	3	.....	2	6	3	.....	2	2	2	5	5	2	1	4	3	19	11	1	62	418	812
October	2	5	1	21	2	6	14	2	9	1	1	5	2	116	1	56	8	.....	3	.....	3	8	.....	.....	1	3	1	11	2	.....	5	2	2	31	4	.....	63	350	742
November	1	1	5	16	1	3	10	.....	6	1	1	3	1	130	1	54	5	2	3	3	1	6	1	.....	4	3	.....	7	2	.....	7	2	2	21	7	4	85	319	720
December	1	5	5	20	3	1	7	3	10	.....	2	2	2	139	.....	87	10	.....	5	2	1	10	.....	.....	3	5	2	2	7	4	1	7	2	40	7	2	74	458	928
Total	19	27	36	234	29	31	105	36	107	4	10	38	16	1,456	5	853	91	5	47	22	23	79	7	6	30	44	21	50	73	30	13	79	19	377	86	32	922	5,191	10,253

TABLE No. XI.

Showing Deaths According to Social Condition During the Year 1902.

Social Condition.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Whites.																									
Single	166	135	147	127	152	134	151	101	129	119	185	165	283	210	233	198	180	157	153	119	151	118	196	136	3,845
Married	129	102	119	80	118	85	147	80	136	75	98	75	97	95	100	79	103	68	112	79	116	79	149	77	2,408
Widows	.....	95	.....	95	.....	95	.....	97	.....	78	.....	68	.....	75	.....	74	.....	64	.....	61	.....	63	.....	93	958
Widowers	51	.....	48	.....	37	.....	34	.....	46	.....	37	.....	53	.....	33	.....	28	.....	38	.....	40	.....	44	...	489
Divorced	1	.....	.....	.....	.....	1	.....	1	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Not given	.....	.....	1	.....	.....	3	2	1	6	.....	3	.....	3	1	.....	2	3	.....	1	1	.....	.....	3	.....	30
Total whites	357	332	315	302	307	318	334	280	317	272	323	308	436	381	366	353	314	289	304	260	307	260	392	306	7,733
Colored.																									
Single	64	54	58	51	69	67	62	63	75	65	80	72	92	57	61	66	76	49	62	51	42	40	60	61	1,497
Married	42	29	40	24	39	22	31	25	32	17	37	24	27	27	21	26	31	26	27	21	27	17	37	33	682
Widows	.....	28	.....	18	.....	21	.....	22	.....	21	.....	22	.....	25	.....	16	.....	20	.....	12	.....	19	.....	26	250
Widowers	6	.....	7	.....	4	.....	7	.....	2	.....	3	.....	4	.....	6	.....	7	.....	5	.....	7	.....	11	.....	69
Divorced	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Not given	.....	.....	.....	1	2	.....	3	2	3	.....	2	3	1	2	.....	.....	.....	.....	.....	1	.....	.....	1	1	22
Total colored	112	111	105	94	114	110	103	112	112	103	122	121	124	111	88	108	114	95	94	84	77	76	109	121	2,520

TABLE No. XII.

Showing the Number of Deaths by Months, According to Causes, During the Year 1902.

Months.	Typhoid Fever.	Smallpox.	Measles.	Scarlet Fever.	Whooping Cough.	Diphtheria and Pseudomembranous Croup.	Croup.	Tuberculosis of Lungs.	Other Tuberculous Diseases.	Cancer.	Diseases of the Nervous System.	Heart Diseases.	Bronchitis.	Pneumonia.	Diarrhoeal Diseases.	Diarrhoeal Diseases under five years.	Diseases of the Digestive System.	Bright's Disease.	Puerperal Fever.	All Other Diseases.	Accidents.	Murder.	Suicide.	Congenital Debility, Premature Births, etc.	Total Deaths under five years.	Total Deaths.
January	10	.....	.....	3	4	14	1	101	10	30	98	60	33	151	9	4	60	69	7	181	37	1	4	29	234	912
February	8	.....	.....	5	2	3	.....	72	7	40	111	64	19	149	11	8	45	57	4	167	25	1	8	18	224	816
March	5	3	1	1	9	6	.....	100	14	43	76	73	35	108	11	5	46	48	7	197	39	1	5	21	236	849
April	13	2	3	.....	11	7	1	114	12	25	80	67	21	107	23	13	46	56	9	178	28	2	7	17	207	829
May	12	.....	2	5	10	10	.....	117	15	34	82	63	18	82	26	16	45	57	3	162	26	3	5	27	216	804
June	13	1	6	4	16	5	.....	100	20	30	98	47	19	42	128	112	51	57	3	155	41	3	6	29	329	874
July	19	.....	8	5	13	1	1	72	15	33	93	42	8	39	302	261	39	64	5	209	48	.....	4	32	506	1,052
August	38	.....	3	3	14	10	2	90	5	30	65	50	9	23	195	158	40	47	3	222	36	3	5	22	386	915
September	43	1	.....	2	4	10	.....	106	10	30	81	52	10	40	82	73	56	30	4	181	29	.....	4	37	296	812
October	29	.....	1	2	5	13	2	92	11	31	87	56	12	57	32	24	34	52	6	159	25	.....	6	30	223	742
November	23	.....	4	6	3	19	2	99	6	26	74	59	22	57	20	11	33	40	7	146	38	.....	4	32	205	720
December	7	.....	13	1	4	23	.....	96	13	32	90	83	35	155	16	10	51	82	4	153	44	1	3	22	265	928
Total	220	7	41	37	95	121	9	1,159	138	384	1,035	716	241	1,010	855	695	546	659	62	2,110	416	15	61	316	3,327	10,253

TABLE No. XIII.

Showing the Number of Deaths from all Causes During the Year 1902.

Diseases.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1.—General Diseases.													
Typhoid fever	10	8	5	13	12	13	19	38	43	29	23	7	220
Intermittent fever and malarial cachexia	2	1	2	2	2	3	2	6	9	....	....	2	31
Smallpox	....	...	3	2	....	1	....	....	1	....	....	....	7
Measles	....	...	1	3	2	6	8	3	....	4	4	13	41
Scarlet fever	3	5	1	....	5	4	5	3	2	2	6	1	37
Whooping cough	4	2	9	....	10	16	13	14	4	5	3	4	95
Diphtheria	14	3	5	4	8	5	1	9	10	9	14	17	99
Pseudo-membranous croup	....	...	1	3	2	....	....	1	....	4	5	6	22
Croup	1	....	...	1	.	...	1	2	....	2	2	....	9
Influenza (la grippe)	10	3	4	3	3	....	1	....	....	....	2	2	28
Cholera nostras	....	....	....	1	2	6	6	....	....	....	1	....	16
Dysentery	1	2	....	4	2	11	23	19	3	6	3	4	78
Erysipelas	4	5	2	5	..	....	3	....	1	....	1	....	21
Mumps	....	....	....	....	....	....	....	....	....	1	....	....	1
Purulent infection and septicæmia	4	3	11	4	5	2	5	3	2	2	2	4	47
Malignant pustule and charbon	....	....	....	....	....	....	1	....	....	....	....	....	1
Rabies	....	....	....	....	....	....	....	....	....	....	....	1	1
Actinomycosis	....	....	....	....	....	....	....	....	1	....	....	.. .	1
Tubercle of the larnyx	1	1	....	3	2	13	....	....	2	3	1	3	29
" " lungs	101	72	100	114	117	100	72	90	106	92	99	96	1,159
" " meninges	4	3	8	6	8	3	6	1	3	4	4	6	56
" " abdominal	1	1	3	2	3	1	1	3	3	3	....	2	23
White swelling	....	...	1	1	....	...	....	....	....	....	....	....	2

Tubercle of other organs	1	2	3	1	2	1	6	1	1	...	1	1	20
Generalized tubercle	3	....	....	....	....	2	2	....	1	1	....	1	10
Scrofula	....	....	....	....	1	....	....	....	....	....	....	....	1
Syphilis	6	3	1	2	2	1	5	....	1	....	2	1	24
Cancer and other malignant tumors—													
Of the buccal cavity	3	2	2	2	1	3	1	....	1	....	1	2	18
" stomach and liver	10	16	16	7	12	10	13	15	10	12	7	17	145
" peritoneum, intestines or rectum	1	4	1	3	3	4	4	2	4	4	5	3	38
" female genital organs	3	11	9	3	8	7	6	1	7	6	6	4	71
" breast	6	5	6	....	5	3	5	4	4	2	1	2	43
" skin	....	....	1	.	1	....	1	3	1	1	...	...	8
" other organs and organs not specified	7	2	8	10	4	3	3	5	3	6	6	4	61
Other tumors, female genitals excepted	2	2	....	2	2	....	3	4	5	....	4	....	24
Rheumatism—acute, articular	5	3	9	1	3	1	3	3	1	1	4	2	36
Rheumatism—Chronic and gout	....	5	2	2	1	....	2	....	1	....	3	1	17
Scorbutus	1	....	1	....	....	....	....	....	....	....	....	....	2
Diabetes	5	4	3	6	4	4	1	3	6	2	3	5	46
Exophthalmic goitre	..	....	....	1	1	....	1	....	....	....	....	1	4
Addison's disease	....	....	....	....	....	....	....	....	1	....	..	....	1
Leukaemia	....	1	....	1	....	....	1	....	....	....	2	....	5
Anaemia and chlorosis	2	1	2	3	1	5	2	4	....	2	2	1	25
Acromegaly	....	....	....	....	....	....	....	1	....	....	....	....	1
Alcoholism—Acute and chronic	1	4	4	4	6	5	1	7	5	3	2	4	46
Lead poisoning	....	....	1	....	....	....	....	....	1	....	....	....	2
Other professional intoxications	....	....	....	....	....	1	....	....	....	....	....	....	1
2.—Diseases of the Nervous System and Organs of Special Sense.													
Encephalitis	1	1	....	....	....	....	....	....	....	....	....	....	2
Meningitis—simple	5	10	8	5	9	10	14	5	7	6	9	7	95
" cerebro-spinal	2	4	....	2	3	7	2	1	3	1	3	1	29
" cerebral	4	4	2	3	....	4	....	1	3	....	3	..	24
" spinal	1	2	1	....	1	2	1	1	1	1	....	1	12

TABLE No. XIII—Continued.

Diseases.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
2.—Diseases of the Nervous System and Organs of Special Sense—Continued.													
Progressive locomotor ataxia	....	2	....	1	....	....	1	....	....	1	1	3	9
Other diseases of the spinal cord	1	4	1	4	3	2	2	1	4	4	1	4	31
Congestion and hemorrhage of the brain	39	28	17	21	28	36	23	26	28	39	29	32	344
Cerebral softening	2	1	4	5	3	2	7	2	7	2	1	4	40
Paralysis without specific cause	20	20	14	14	17	9	13	8	10	10	11	16	162
General paralysis	....	2	1	2	1	....	2	1	....	2	....	1	12
Other forms of insanity	1	....	1	1	....	....	....	....	2	....	....	1	6
Epilepsy	4	2	3	3	2	1	1	1	....	....	2	1	20
Convulsions, not puerperal	1	1	1	....	1	....	....	....	....	....	....	....	4
Convulsions of infants	10	22	16	13	9	16	21	13	8	15	11	12	166
Tetanus	2	2	2	....	3	5	1	4	2	1	....	4	26
Chorea	....	....	....	....	....	....	1	....	....	....	....	....	1
Other nervous diseases	5	6	5	6	2	4	4	1	6	5	5	3	52
Diseases of the ear and its adnexa	1	....	2	1	1	....	....	1	1	....	....	..	7
3.—Diseases of the Circulatory System.													
Pericarditis	...	1	....	....	1	....	....	2	....	....	....	1	5
Endocarditis	4	6	2	5	6	2	3	2	1	2	6	5	44
Organic heart diseases	51	52	69	59	54	43	36	46	49	50	53	72	634
Angina pectoris	5	5	2	3	2	2	3	...	2	4	....	5	33
Affections of the arteries—atheroma, aneurism, etc.	19	7	16	9	12	10	7	4	8	7	7	6	112
Embolus and thrombosis	....	1	....	1	....	....	....	....	....	....	1	2	5
Affections of the veins, varices, hemorrhoids, phlebitis	1	1	....	....	....	....	1	....	....	....	1	...	4
Affections of lymphatic system, lymphangitis, etc.	1	2	....	....	....	....	....	....	....	1	....	....	4

4.—Diseases of the Respiratory System.													
Affections of the larynx	1	1	2	1	....	..	....	....	....	....	....	2	7
Acute bronchitis	17	16	26	15	9	11	3	2	6	10	9	24	148
Chronic bronchitis	16	3	9	6	9	8	5	7	4	2	13	11	93
Broncho-pneumonia	25	32	23	25	12	12	3	4	6	9	11	37	199
Pneumonia	126	117	85	82	70	30	36	19	34	48	46	118	811
Pleurisy	6	2	3	3	4	1	3	2	1	....	....	3	28
Congestion of the lungs	2	3	7	1	5	2	....	1	2	1	3	5	32
Gangrene of the lungs	....	1	....	....	....	....	....	....	....	....	2	....	3
Asthma	3	2	2	4	5	2	1	2	2	1	3	2	29
Pulmonary emphysema	1	2	....	....	1	....	....	1	....	1	....	1	7
Other diseases of the respiratory system (phthisis excepted)	2	1	3	3	5	....	1	1	4	3	7	7	37
5.—Diseases of the Digestive Apparatus.													
Affections of the mouth and its adnexa	1	1	....	2	....	....	....	....	....	....	1	1	6
" " pharynx	2	....	1	....	....	....	....	....	....	....	....	....	3
" " oesophagus	....	1	....	....	....	....	....	....	....	1	2	....	4
Ulcer of the stomach	2	2	2	....	1	1	1	2	2	8	....	1	22
Other affections of the stomach, cancer excepted	18	12	14	18	18	13	9	13	20	4	9	17	165
Diarrhoea and enteritis, under five years of age	4	8	5	13	16	112	261	158	73	24	11	10	695
" " above five years of age	4	1	6	6	8	5	18	18	6	2	6	2	82
Hernia and intestinal obstruction	12	3	7	7	3	10	6	5	8	9	5	12	87
Other affections of the intestines	2	2	5	2	3	....	2	3	1	3	2	3	28
Icterus gravis	....	1	1	3	....	....	....	....	1	1	....	....	7
Cirrhosis of the liver	6	8	6	3	9	9	9	6	8	3	3	2	72
Biliary calculi	2	..	2	2	....	3	...	1	....	....	....	2	12
Other affections of the liver	4	5	2	4	3	3	5	2	6	4	2	1	41
Affections of the spleen	....	....	....	....	....	....	....	....	....	....	....	1	1
Peritonitis, not puerperal	5	3	....	1	1	3	2	2	4	1	4	5	31
Other affections of the digestive apparatus, cancer and tubercle excepted	....	1	....	....	....	....	....	....	....	....	....	....	1
Apendicitis and abscess of the iliac fossa	6	6	6	4	7	9	5	6	6	....	5	6	66

TABLE No. XIII—Continued.

Diseases.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
6.—Diseases of the Genito-Urinary Apparatus and its Adnexa.													
Acute nephritis	3	3	7	2	1	2	3	6	4	3	2	....	36
Bright's disease	69	57	48	56	57	57	64	47	30	52	40	82	659
Other diseases of the kidneys and their adnexa	....	2	....	2	....	1	....	1	2	2	2	2	14
Calculi of the urinary tract	1	1	....	....	1	....	....	1	....	1	....	....	5
Diseases of the bladder	4	4	2	3	1	1	4	2	....	3	2	...	26
Diseases of the urethra, urinary abscess	1	....	2	....	1	....	....	1	....	1	1	1	8
Diseases of the postate	....	....	....	1	1	....	....	1	1	2	2	3	11
Non-venereal diseases of the male genital organs	....	....	1	....	...	....	....	...	....	...	....	....	1
Metritis	1	....	....	....	....	...	....	....	....	1	1	....	3
Uterine hemorrhage, non-puerperal	....	....	....	1	....	....	....	....	1	....	....	....	2
Uterine tumor, non-cancerous	....	3	2	2	....	2	2	3	1	....	2	2	19
Other diseases of the uterus	1	....	1	....	....	....	....	....	....	....	1	1	4
Cysts and other tumors of the ovary	....	....	.. .	3	1	....	....	....	....	....	...	1	5
Other diseases of the female genital organs	....	1	4	2	2	....	1	3	2	....	1	1	17
7.—The Puerperal State.													
Accidents of pregnancy	3	....	....	3	....	1	3	....	....	1	1	2	14
Puerperal hemorrhage	1	....	2	1	2	....	...	2	1	3	1	..	13
Other accidents of labor	....	....	3	2	....	....	2	3	....	....	....	....	10
Puerperal septicaemia	7	4	7	9	3	3	5	3	4	6	7	4	62
Puerperal albuminuria and eclampsia	....	2	....	....	5	....	2	3	1	1	...	1	18

8.—Diseases of the Skin and Cellular Tissue.													
Gangrene	....	....	1	2	1	1	2	1	1	1	2	2	14
Furuncle (carbuncle)	....	1	...	2	....	....	....	...	1	1	....	1	6
Phlegmon, warm abscess	....	1	1	2	....	....	3	4	1	....	....	1	13
Other diseases of the skin and its adnexa	....	....	1	1	1	....	1	1	1	....	2	....	8
9.—Diseases of the Organs of Locomotion.													
Affections of the bones	2	1	1	....	3	3	1	1	1	2	1	1	17
10.—Malformations.													
Malformations, congenital (still births excepted)	1	....	1	2	5	2	6	2	2	2	4	3	30
11.—Early Infancy.													
Congenital icterus, debility and sclerema	29	18	21	17	27	29	32	22	37	30	32	22	316
Other diseases of early infancy	....	....	2	2	....	2	....	....	....	1	....	1	8
Lack of care (inanition, malnutrition, etc.)	41	43	51	38	46	60	91	102	87	65	40	31	695
12.—Old Age.													
Senile debility	30	35	26	37	18	27	21	26	14	26	20	35	315
13.—Affections Produced by External Causes.													
Suicide—By poison	1	1	1	3	2	4	....	2	2	2	2	1	21
" " asphyxia	....	2	....	1	....	1	1	....	1	....	....	....	6
" " hanging or strangulation	1	1	....	....	....	1	....	1	....	....	....	....	4
" " drowning	....	....	....	....	1	....	1	....	....	....	....	1	3
" " firearms	1	4	4	1	1	....	2	1	....	2	1	1	18
" " cutting instruments	....	....	....	1	1	....	....	1	1	....	1	....	5
" " precipitation from a height	1	....	....	1	....	....	....	....	....	1	....	....	3

TABLE No. XIII—Continued.

Diseases.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
18.—Affections Caused by External Causes—Continued.													
Fractures of the femur	2	2	....	....	4	....	2	....	...	1	....	3	14
" " skull	4	1	3	3	1	....	2	3	1	1	2	1	22
" " vetebrae	....	1	....	....	....	....	....	....	....	....	....	....	1
" other	1	....	2	3	....	...	2	3	....	1	...	1	13
Other accidental injuries—													
Dystocia	....	1	5	1	1	2	1	....	2	4	3	5	25
Electric shock	....	....	....	....	....	....	....	1	1	...	1	1	4
Falls	....	2	5	3	3	6	4	6	3	3	5	1	41
Gunshot	....	....	1	1	1	....	2	2	1	....	2	1	11
Railroad accidents and injuries	7	2	7	5	2	4	8	2	6	1	9	8	61
Vehicles and horses	2	1	...	....	1	1	....	1	2	1	....	...	9
Burns, by fire	6	6	5	3	5	8	3	3	6	6	11	11	73
" by liquids (scalds)	...	...	1	....	1	1	1	1	1	1	....	....	7
Sunstroke (insolation)	....	....	....	....	....	4	4	1	....	....	....	....	9
Accidental drowning	1	1	2	5	3	11	14	11	3	2	1	2	56
Inanition	....	....	....	....	....	1	....	....	....	1	....	....	2
Absorption of deleterious gases (suicide excepted)	5	1	4	....	1	...	1	....	....	2	2	6	22
Other acu e poisonings	....	2	1	1	2	2	1	1	....	....	1	2	13
Other external violence—homicide	1	1	1	2	3	3	....	3	....	....	....	1	15
" " " legal executions	....	....	....	....	....	....	....	....	1	....	....	....	1
" " " other accidents	9	5	3	3	1	2	3	1	3	2	1	2	35

14.—Causes Ill-Defined.

Dropsy	1	....	....	1	1	....	3	....	1	5	....	2	14
Sudden death (not puerperal)	....	....	....	1	3	4	8	3	3	6	....	6	34
Unspecified or ill-defined	12	12	11	6	4	4	4	2	....	4	7	4	70
Total	912	816	849	829	804	874	1052	915	812	742	720	928	10253

TABLE No. XIV.

Showing Total Deaths and Deaths from Zymotic Diseases for Twenty-eight Years, with Percentage of Deaths to Total Mortality from 1875 to 1902, Inclusive.

	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Total deaths, exclusive of still births	7,258	7,498	7,910	6,733	7,618	8,043	8,816	8,923	9,380	8,035	8,153	8,339	8,244	8,936	9,365	10,198	10,073	10,582	9,554	9,486	10,301	9,919	9,329	10,385	10,152	10,700	10,479	10,253
Death rate	22.33	22 38	22.60	18.44	19.30	20.41	22.37	21.81	22.93	20.77	19.55	19.98	19.16	17.87	17.40	22.41	22.14	23.25	20.99	20.84	20.76	19.60	18.43	19.19	18.76	19.77	19.63	18.70
Still births	560	588	538	655	620	636	651	677	701	746	650	718	669	694	784	800	811	813	770	721	666	678	706	748	706	682	672	6.59
Rate of still births to 1,000 inhabitants	1.70	1.75	1.53	1.79	1.57	1.61	1.65	1.71	1.71	1.82	1.59	1.72	1.60	1.63	1.84	1.75	1.78	1.78	1.69	1.58	1.34	1.33	1.39	1.38	1.41	1.46	1.30	1.26
DEATHS FROM ZYMOTIC DISEASES.																												
Diphtheria and croup	238	249	557	452	384	476	881	929	792	470	400	318	302	216	206	319	394	428	210	231	310	281	360	412	312	279	171	130
Fever, scarlet	519	562	447	141	80	400	215	179	334	104	68	32	36	44	71	42	128	258	36	85	59	31	53	46	24	20	11	37
Fever, typhoid	187	176	201	175	367	196	197	165	126	151	155	150	156	161	191	247	150	193	224	222	173	188	189	189	153	189	141	220
Fever, cerebro spinal	53	25	17	26	1	26	37	38	42	20	24	24	19	22	18	31	18	38	59	26	27	32	22	3	.....	41	28	29
Whooping cough	78	39	303	63	80	148	93	43	59	120	63	91	98	112	54	100	103	32	60	112	68	87	42	64	19	47	63	95
Measles	15	43	151	11	43	12	75	71	130	228	16	201	85	176	11	248	16	120	39	3	68	27	16	48	5	24	3	41
Smallpox	1	.....	.....	1	1	1	11	551	633	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	7
Total zymotic diseases	1,091	1,094	1,676	869	956	1,259	1,509	1,976	2,116	1,094	726	817	696	731	551	987	809	1,069	628	679	705	646	682	762	514	600	417	559
Percentage of zymotic deaths to total mortality	15.03	14.59	21.18	12.90	12.53	15.65	17 11	22.14	22.25	13.51	8.90	9.78	8.46	8.18	5.88	9.67	8.03	10.10	6.57	7.15	6.84	6.51	7.31	6.85	5.06	5.60	3.98	5.45

TABLE No. XV.

Showing the Number of Cases Reported and Mortality from the Principal Zymotic Diseases During the Years 1894, 1895, 1896, 1897, 1898, 1899, 1900 and 1901, Compared with 1902, with Percentage of Death to Cases Reported in Each Year.

Diseases.	Cases reported in 1894.	Deaths reported in 1894.	Percentage of Deaths in 1894.	Cases reported in 1895.	Deaths reported in 1895.	Percentage of Deaths in 1895.	Cases reported in 1896.	Deaths reported in 1896.	Percentage of Deaths in 1896.	Cases reported in 1897.	Deaths reported in 1897.	Percentage of Deaths in 1897.	Cases reported in 1898.	Deaths reported in 1898.	Percentage of Deaths in 1898.	Cases reported in 1899.	Deaths reported in 1899.	Percentage of Deaths in 1899.	Cases reported in 1900.	Deaths reported in 1900.	Percentage of Deaths in 1900.	Cases reported in 1901.	Deaths reported in 1901.	Percentage of Deaths in 1901.	Cases reported in 1902.	Deaths reported in 1902.	Percentage of Deaths in 1902.
Diphtheria	267	198	74.15	371	265	71.42	480	249	51.87	1491	347	23.27	2077	412	19.83	1780	312	17.52	1858	279	15.01	1169	171	14.62	972	130	13.37
Scarlet Fever	999	85	8.50	775	59	7.61	694	31	4.46	928	53	5.71	588	46	7.82	434	24	5.52	402	20	4.97	391	11	2.81	481	37	7.69
Croup *a*	142	33	23.33	258	45	17.44	173	32	12.65	129	13	10.07	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Measles	98	3	3.06	2332	68	2.91	1002	27	2.69	659	16	2.42	1419	48	3.38	594	5	.84	2770	24	0.86	466	3	0.64	1909	41	2.10
Varioloid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Varicella	53	1	1.88	40	.....	.....	68	2	2.94	47	1	2.12	119	.....	.....	183	.....	.....	192	.....	.....	199	1	0.50	231	0	.....
Whooping cough	320	112	35.00	171	68	39.76	266	87	32.87	213	42	19.71	335	64	19.10	129	19	15.83	239	47	19.66	257	63	24.51	395	95	24.05
Mumps	80	1	1.25	62	2	3.22	73	1	1.36	132	.....	.....	22	.....	.....	26	.....	.....	160	.....	.....	214	1	0.47	71	1	1.40
Typhoid fever	.....	222	.....	*260	173	66.53	472	188	39.83	363	189	52.06	545	186	34.68	462	153	33.11	871	189	21.70	792	141	17.80	1086	220	20.26
Consumption	.....	1106	.....	.....	1141	.....	.....	1122	.....	.....	1047	.....	.....	1061	.....	.....	974	.....	274	1056	385.40	384	1274	331.77	356	1297	364.33
Pneumonia	.....	790	.....	.....	933	.....	.....	884	.....	.....	759	.....	.....	889	.....	.....	898	.....	.....	1303	.....	.....	1147	.....	.....	1010	.....
Cholera infantum	.....	440	.....	.....	510	.....	.....	412	.....	.....	401	.....	.....	386	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Intestinal diseases	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	703	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Cholera Infantum now included in Infantile Diarrhoea, etc.
Croup included with Diphtheria.

TABLE No. XVI.

Showing the Number of Deaths Annually from Typhoid Fever During a Period of Thirteen Years from 1888 to 1902, Inclusive, Male and Female, White and Colored, in the City of Baltimore.

Year.	Estimated Population.	White.			Colored.			Total Males.	Total Females.	Total Deaths.
		Males.	Females.	Total.	Males.	Females.	Total.			
1888	395,899	88	90	178	80	14	94	168	104	272
1889	404,498	88	93	181	23	20	43	111	113	224
1890	413,671	135	109	244	26	31	57	161	140	301
1891	426,917	82	75	157	13	19	32	95	94	189
1892	440,163	90	102	192	19	15	34	109	117	226
1893	453,409	108	120	228	11	16	27	119	136	255
1894	466,665	103	104	207	23	27	50	126	131	257
1895	479,907	82	75	157	21	14	35	103	89	192
1896	493,147	93	81	174	16	14	30	109	95	204
1897	506,398	99	76	175	20	14	34	119	90	209
1898	541,000	96	62	158	19	24	43	115	86	201
1899	541,000	67	52	119	18	16	34	85	68	153
1900	541,000	83	69	152	21	16	37	104	85	189
1901	518,000	66	44	110	11	20	31	77	64	141
1902	525,000	99	73	172	24	24	48	123	97	220

TABLE No. XVII.

Comparison of Deaths from All Causes, and from Specified and Contagious Diseases for Twenty-five Years, from 1877 to 1902, inclusive.

Years.	Population.	Measles.	Scarlet Fever.	Typhoid Fever.	Croup.	Diphtheria and Pseudo-membr. Croup.	Whooping Cough.	Dysentery.	Cholera Infantum.	Children Under 5 Yrs.	Total Mortality. All causes.
1877	311,275	161	597	235	157	455	297	52	616	4,584	7,910
1878	318,182	11	141	176	149	303	63	41	343	3,372	6,733
1879	325,139	43	367	166	186	298	80	60	475	3.385	7,618
1880	332,313	12	400	196	173	293	148	57	503	3,602	8,043
1881	339,649	162	215	197	242	639	93	56	558	3,919	8,116
1882	347,142	71	179	165	222	707	43	62	390	3,755	8,923
1883	354,832	130	334	126	201	591	59	52	473	4.062	9,380
1884	362,668	228	104	151	127	343	120	43	496	3,643	8,293
1885	370,696	16	68	155	148	252	63	60	498	3.228	8,153
1886	378,903	201	32	150	128	190	91	84	485	3,565	8,339
1887	387,300	85	36	156	153	149	98	137	567	3,477	8.372
1888	395,899	176	44	161	98	118	112	167	654	3,881	8,936
1889	404,498	11	71	191	53	155	54	156	572	3,505	8,703
1890	413.671	248	42	247	45	274	100	212	507	4,117	10,198
1891	426,917	16	128	150	44	350	103	118	531	3,910	10,073
1892	440,163	120	258	193	47	381	32	109	661	4,443	10,582
1893	453,409	39	36	224	25	185	60	62	444	3,604	9,554
1894	466,655	3	85	222	33	198	112	72	440	3.761	9,486
1895	479,907	68	59	173	45	265	68	70	510	4,026	10,301
1896	493,147	27	31	183	32	249	87	82	412	3.728	9,919
1897	506,398	16	53	189	13	347	42	57	401	3.510	9,329
1898	541,000	48	46	189	50	362	64	82	386	3,939	10,385
1899	541,000	5	24	153	.....	312	19	.....	.....	3.319	10,152
1900	541,000	24	20	189	12	267	47	77	848	3.695	10,700
1901	518.000	3	11	141	7	164	63	49	726	3,391	10,479
1902	525,000	41	37	220	9	121	95	78	695	3.327	10,253

TABLE No. XVIII.

SALARIES—HEALTH DEPARTMENT, FOR YEAR 1902.

To appropriation	$57,576 00	By voucher A	$4,654 63
		" " B	4,819 63
		" " C	4,819 63
		" " D	4,780 92
		" " E	4,819 63
		" " F	4,819 63
		" " G	4,819 63
		" " H	4,819 63
		" " J	4,773 66
		" " K	4,774 63
		" " L	4,715 31
		" " M	4,819 63
		" unexpended balance	139 44
	$57,576 00		$57,576 00

TABLE No. XIX.

General Health Account for the Year 1902—Appropriation	$12,599 00
For Account of Smallpox—Appropriation	5,730 00
Total	$18,329 00

To 485 Warrants on Comptroller	$18,329 00	By antitoxine	$1,429 79
		By fumigations	451 62
		By car fare	615 00
		By advertising	85 23
		By subscriptions to journals	69 33
		By coffins for pauper dead	123 05
		By rent 1330 Philpot street	156 00
		By publishing annual report	1,026 50
		By ice and incidentals for City Morgue	335 51
		By disinfectants	517 94
		By vaccine virus	898 00
		By digging graves	20 00
		By care of city patients	127 25
		By telephone rentals	346 29
		By postage	846 00
		By hire of horses and livery	1,820 70
		By bacteriological laboratory	915 21
		By chemical laboratory	553 99
		By sundry accounts	1,010 88
		By guarding infected houses	151 71
		By care of smallpox	6,828 37
	$18,329 00		$18,329 00

TABLE No. XX.

Statement of Appropriations to, Expenditures by, and Unexpended Balances of the Sub-Department of Health, Department of Public Safety, for the Year Ended December 31, 1902.

Appropriations.	
Salaries	$57,576 00
General health	12,599 00
Emergency fund for care of smallpox	5,730 00
Salaries, Quarantine Station	11,065 00
General expense, Quarantine	6,960 00
Appropriation for artesian well	600 00
Total	$94,530 00
Expenditures.	
Salaries	$57,436 56
General health and emergency accounts	18,329 00
Salaries, Quarantine Station	11,032 50
General expense, Quarantine Station	7,560 00
Total	$94,358 06
Unexpended Balances.	
Salaries	$139 44
Salaries, Quaratine Station	32 50
Received for transcripts, births and deaths	215 50

TABLE No. XXI.

SALARIES QUARANTINE STATION, 1902.

To appropriation	$11,065 00	By voucher A	$ 895 00
		" " B	920 00
		" " C	941 00
		" " D	920 00
		" " E	931 00
		" " F	920 00
		" " G	915 00
		" " H	920 00
		" " J	920 00
		" " K	915 00
		" " L	920 00
		" " M	915 00
		" unexpended balance	32 50
	$11,065 00		$11,065 00

TABLE No. XXII.

QUARANTINE STATION ACCOUNT FOR THE YEAR 1902 - APPROPRIATION $7,560 00.

To 178 warrants on Comptroller	$7,560 00	By provisions	$1,292 67
		By groceries	846 05
		By ice	117 95
		By coal for tugboat and household use	865 14
		By new flags	26 00
		By rebate of inspection overcharge	10 15
		By advertisements	92 95
		By subscriptions to newspapers	11 50
		By car fare	20 00
		By clothing for smallpox patients	50 27
		By sundry household supplies	436 04
		By artesian well	693 44
		By repairs to and supplies for tugboat	1,195 78
		By farm implements, seeds, etc	155 83
		By hire of tugboats	148 00
		By fumigations	118 55
		By horse feed	406 32
		By drugs	30 45
		By gasoline launch	1,042 96
	$7,560 00		$7,560 00

TABLE No. XXIII.

REPORT OF INSPECTIONS OF NUISANCES MADE AND ORDERED ABATED BY SANITARY INSPECTORS DURING 1902.

Number of alleys to be cleaned	708
" alleys to be repaired	1,116
" alleys to be paved	185
" premises to be cleaned	262
" vacant lots to be drained, filled and cleaned	172
" manure pits to be constructed	106
" manure pits to be reconstructed and repaired	44
" manure pits to be cleaned	204
" drain pipes to be reconstructed and repaired	126
" drain pipes to be cleaned	46
" drain pipes to be laid	56
" defective plumbing ordered reconstructed and repaired.	302
" yards to be cleaned	2,404
" yards to be drained	77
" yards to be repaired	255
" yards to be paved	80
" privies inspected and ordered cleaned	29,909
" privies to be reconstructed	271
" to be ventilated	24
" water closets to be repaired and ventilated	104
" excavating apparatuses inspected	117
" cellars to be drained and filled	909
" cellars to be cleaned	1,280
" slaughter houses inspected	8
" stables to be reconstructed and cleaned	75
" water pipes and hydrants to be repaired	466
" gutters to be repaired	184
" rainspouts to be reconstructed	81
" grass and weeds to be removed from gutters	755
" ice ponds examined and permits granted	5
" tenements ordered cleaned and whitewashed	14
" samples of water collected for analysis	38
" causes of death examined	1
" sweat shops examined	27
" complaints examined and no nuisance found to exist	353
" miscellaneous and extra examinations made	25,582
" premises disinfected	1
" bacteriological cultures made	163
" schools examined	69
" legal proceedings instituted for failure to comply with notices	126

TABLE No. XXIV.

Contagious Diseases Inspected.

Number of cases of	diphtheria	864
" " "	scarlatina	455
" " "	membranous croup	39
" " "	whooping cough	320
" " "	mumps	57
" " "	chicken pox	217
" " "	typhoid fever	826
" " "	varioloid	2
" " "	smallpox	2
" " "	cerebro-spinal meningitis	1
" " "	measles	1,717
" " "	tuberculosis	1
" " "	vaccinations	46,412
" " "	visits to vaccinate	4,976
" " "	examinations of vaccinations	10,111
" " "	school certificates issued	11,342
" " "	police station calls	511
" " "	units of diphtheria antitoxine injected	214,000

TRANSCRIPTS FROM THE RECORDS OF BIRTHS AND DEATHS

For the Year Ending December 31, 1902.

Purposes.	From the Records of Deaths.												
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Pension	8	12	9	16	9	14	28	10	14	10	16	25	171
Insurance	19	16	16	12	12	20	11	5	20	15	23	16	195
Proof of death	3	3	0	2	1	2	1	0	3	3	0	1	19
Legal	0	0	3	2	1	3	0	2	7	0	4	1	23
Foreign	6	2	4	4	1	0	0	1	1	1	0	2	22
	46	33	32	36	24	39	40	18	45	29	43	45	430

Purposes.	From the Records of Births.												
	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Pension	0	2	0	1	0	0	0	0	0	0	0	0	3
Foreign	0	0	0	0	0	0	0	0	0	0	1	0	1
Legal	0	0	0	0	0	0	0	0	1	1	0	0	2
	0	2	0	1	0	0	0	0	1	1	1	0	6

Grand total of 436. Collections $215 50.

Respectfully submitted. John H. Uhlenberg, *Registrar's Clerk.*

REPORT

OF THE

Bacteriologic Laboratory.

Pathology of Smallpox.

It is a curious fact that although smallpox is among one of the earliest diseases to have received an accurate description, yet its cause has but recently become known.

It is not mentioned in the Egyptian records, the books of the Old or New Testament, or in the old Greek or Roman writings.

Rhazes, in the ninth century, however, gives an account of the disease in his Arabic "Treatise on the Smallpox and Measles," translated from the Latin edition into English in 1756.

The work begins with these words, "In the name of God, the Compassionate, the Merciful."

Rhazes recognized its infectious nature, and described the premonitory symptoms, such as fever, nausea and pain in the back. He described the varieties of discrete and confluent smallpox, and gave a most elaborate series of remedies to be used in treating the disease.

PATHOLOGY.

A number of interesting changes have been noted in the various tissues and viscera of smallpox cases, and these changes are widely distributed throughout the system.

The pustular eruption is frequently found on the surface of the mucous membrane of the respiratory tract, and these often coalesce as ulcers, or masses of fibrinous inflammation.

These pustules and ulcers are often seen in the bronchi of the third and fourth order, and are quite frequent at the bifurcation of the bronchi. Necrosis of the surface epithelial cells is also very frequent, and fibrinous and purulent inflammation is also often present.

The lung often contains areas of broncho-pneumonia, and the liver, the kidney and the heart muscles show cloudy swelling and fatty degeneration. The heart muscle also often exhibits fragmentation of the fibres. The acute, soft splenic tumor of infection is usually present.

An interesting set of changes has been described by Weigert,[1] consisting in areas of local necroses in the liver, spleen, kidney and lymph glands. These areas consist of degenerated masses of coagulative necrosis containing much nuclear detritus, and many degenerated cells without nuclei.

The lesions of the bone-marrow first described by Chiari,[2] and called "osteomyelitis variolosa," are said to occur in 72 per cent. of all cases. These small scattered nodules are about the size of a pea, and under the microscope they consist principally of epithelioid cells, which are probably produced from the normal marrow cells by proliferation. Leucocytes and traces of fibrin are also present, and the masses often undergo coagulative necrosis.

Chiari examined the bone-marrow of 22 cases of smallpox in various stages with the following results: During the stage of simple early eruption, he investigated five cases, and found microscopic changes in three instances. Nine cases were observed in the pustular stage, of which eight gave positive results. Eight cases were examined in the stage of healing or scaling, and all gave positive results. In one of two cases who died from other cases about two months after recovery from smallpox, these necrotic masses were found.

The process is found especially in the yellow marrow of such bones as the femur, tibia, ribs, sternum, and the body of the vertebræ, and begins by a proliferation of the normal marrow cells. These form masses of cells, whose nuclei are surrounded by much cytoplasm. A few neutrophilic leucocytes are also found in these masses of epithelioid cells, and they soon show a central area of necrosis which often contains fibrin. He only demonstrated micrococci in one case as present in these necrotic masses.

Similar areas are frequently found in the testicle, and this condition is called "orchitis variolosa." In the hemorrhagic smallpox the above changes are usually present in combination with local hemorrhages in the skin and various serous cavities.

CHANGES IN THE SKIN.

The first change, according to Unna,[3] consists in an edema and swelling of the epithelium. Many of these cells undergo softening and colliquation, forming a cavity, while others remain as septa, dividing the cavity up into smaller loculi.

The epithelial cells undergo a special degeneration which is known as ballooning, and which affects all of the various layers, even penetrating into the hair follicles. These swollen cells often attain from two to three times their normal size. They sometimes retain their nuclei, but the cytoplasm becomes perfectly clear, and the nuclei are often fragmented. It is a variety of coagulative necrosis. Sometimes two or three nuclei are present in one cell.

The epithelial cells continue to undergo liquefaction, and this causes an increase in the size of the cavity, at the same time mitoses are found in the cells forming the circumference of the cavity. The cells become compressed, and undergo fibrinoid degeneration, forming strands in the cavity which give the reaction for fibrin.

Umbilication is explained by the fact that the degeneration and edema of the epithelial cells takes place more at the periphery of the vesicle. The less swollen centre remains behind. Unna does not believe that the cords of the compressed epithelial cells running through the vesicle act as guy ropes, but that the edema and compression is exerted more at the sides of the vesicle, and thus this portion of the lesion extends beyond the less compressed centre.

In the vesicular stage an exudation of serum takes place, and neutrophilic leucocytes also emigrate from the vessels into the vesicle forming the pus of the vesicle. These infil-

trate the cutis, and also soon fill the vesicle, producing the pustular stage of the disease. This primary invasion of leucocytes is due to the smallpox poison, but often at the end of the first week there is a second leucocytic invasion, due to a secondary infection with the pyogenic cocci.

HEALING.

As the pustule begins to dry, a scale or crust is formed, and the lesion is invaded by sprouting projections of newly-formed epithelial cells. The upper layers become horny, the lower layers form the other normal cellular layers. In order not to form a scar, the newly formed epithelial cells must grow in an even layer with the convex surface downward, and the stratum Malpighii must not have been destroyed by the process of degeneration.

PLASMA CELLS.

There is one change which should be mentioned in this connection, and that is the appearance of the plasma cells in the corium. It is held by many that the injury caused by the poison to the epithelial cells is the very first change which is apparent. Dr. Gilchrist, however, has kindly loaned me some sections made from very early papules, and although the epithelial cells show little or no changes, the cutis shows a marked infiltration with plasma cells. These are usually collected about small arteries and capillaries.

Dr. Gilchrist is of the opinion that this plasma-cell invasion is the earliest change to be noted in smallpox, and this opinion accords very well with the best conception of the method of infection.

It is inconceivable that the poison comes in contact with every portion of the skin at practically the same time, thus causing infection. It seems more rational to believe that the cause is inhaled and that by means of the circulation it reaches the skin, where it causes widely distributed lesions.

The primary exudation of the plasma cells from vessels followed by the various epithelial lesions supports this theory.

PATHOLOGICAL STUDY.

The following pathological study was made from a series of five autopsies performed during the past year, and from sections and cultures in six non-fatal cases.

All of the cultures in the non-fatal cases were made from vesicles or early pustules, and in every case they remained sterile. Five sets of cultures were made from the autopsies, and in all of these cases the condition had advanced well into the pustular stage. Four cases gave a pure growth of the streptococcus pyogenes from the pustules, and one case of hemorrhagic smallpox showed the presence of the staphylococcus pyogenes aureus.

Various attempts were made to cultivate the specific cause of the disease. Material from bacteriologically sterile pustules was inoculated into eggs, on the surface of coagulated egg albumen, and in 1 per cent. sterile milk, as this is said to be a good nutrient material for amebae. All of the results were negative.

PATHOLOGICAL CHANGES IN SMALLPOX.

In two of the five cases the respiratory tract was the seat of extensive changes. The inner surface of the larynx and trachea were both almost entirely covered with a dirty yellowish pseudomembrane. The under surface of the epiglottis was also involved.

HISTOLOGICAL CHANGES.

The primary condition consisted in an extensive degeneration of the lining epithelium. Often the limiting membrane of the nucleus was destroyed, and the chromatin was scattered as a fine dust through the cytoplasm, showing the condition known as nucleorhexis. Hyperchromatosis and

irregularity in the size and shape of the nuclei also existed. These changes result in complete granular necrosis of the epithelium, and cause a necrotic layer without fibrinous deposits.

The submucous coat is often separated from the mucous coat by an exudation of fibrin and serum, and the former coat, together with the muscular coat, are richly infiltrated with plasma cells, small lymphocytes and cells resembling epitheliod cells. Even the cartilage cells show changes, consisting in the disappearance of the cytoplasm of the cell. The cell often forms an empty vacuole, with the nucleus forced to one side.

Streptococci in great numbers were stained in the masses of superficial necrotic cells, and in the vessels of the submucous coat.

LUNGS.

The pleural surfaces of one case were dotted by vesicles about the size of a number six shot. These were very numerous, and on microscopic examination they seemed to be large lymph spaces distended with a serous fluid. One case showed a fibrinous pleurisy, and in three cases bronchopneumonia existed.

In two of the cases the typical necrotic areas existed, which are so characteristic of smallpox. These consisted of a central area of coagulative necrosis containing numerous groups of streptococci. The necrotic centres were surrounded by a zone of cells, consisting of small lymphocytes, proliferated alveolar endothelial cells, and a few leucocytes. Both the necrotic area and the surrounding cells show masses of nuclear fragmentation, and many of the cells simply form a mass of granular debris.

The presence of actual bacteria in such large numbers in local necrotic areas is a departure from the usual rule, as in typhoid fever, eclampsia, diphtheria, and other diseases showing these changes, the bacteria are not present neces-

sarily, and the change is probably due to the toxin, or mechanical effects of cellular or fibrinous thrombi. Figure 1 shows streptococci in an exudate in an air cell. Fig. 1 *a* shows the curious vesicles which were found on the pleural surface of both lungs in one of the cases of smallpox. At "a," two large distended clear spaces are seen, and "b" shows the normal lung tissue.

HEART MUSCLE.

Histological Pathology.

In three cases the nuclei of the cardiac muscular fibres showed great irregularities in size, many being small and shriveled. Others were enlarged, irregular, oval or round, and stained more lightly than normal. In one case there was evidence of longitudinal splitting of the fibres, on cross section a central channel, containing radiating smaller connecting lines resembling a fine tooth comb, being present.

THE LIVER.

The livers in all cases were enlarged and yellowish, but very little fatty change was found microscopically. Cloudy swelling, the accompaniment of all acute infections, was always present. Under the microscope the enlargement was found to be due to congestion and cloudy swelling, and no fatty areas were seen. In one case a few collections of proliferated endothelial cells and small lymphocytes were present without actual general necrosis, and in another case necrotic areas, somewhat similar to those described in the lung, were detected. These two different varieties of necrosis of the liver correspond to those described by Councilman[4] and Mallory in their studies of the liver in diphtheria. The first variety they called disseminated necrosis, and these usually only consist of a collection of cells of various types. The liver cells present are necrotic and broken down, and the nuclei showed various stages of degeneration.

Among the necrotic liver cells a few proliferated endothelial cells and leucocytes are usually found.

Although these changes were only made out in the liver of one of the five cases, the degeneration of the liver cells and the proliferation of the endothelial cells could be made out in these small areas, which in this particular case usually consisted of about twenty-five cells.

In one case, that of a child two years old, the so-called central necroses of Councilman and Mallory were detected in the liver. These usually occur near the central vein in diphtheria, but in the one case of smallpox they were found in connection with the portal systems, and even in the middle of the lobules. They simply consisted of large collections of broken down necrotic masses of a homogeneous material resulting from the destruction of liver cells. These areas took on a brilliant red stain when treated with methylene blue and eosin. The necrotic areas are marked by large collections of nuclear detritus, and the destruction of liver cells can be well made out on the edge of the areas. The protoplasm of the cells coalesces into homogeneous masses, and in the early stages of destruction the chromatin of the nucleus breaks up into large irregular fragments, which are scattered through the cytoplasm of the cells. This was in a case of general streptococcus infection, but streptococci did not seem to play any important part in the production of these areas as particulate bodies. A few streptococci were found on the edge of these areas, but they were not detected in the middle of the necrotic material. Throughout the rest of the liver large groups of streptococci were found in the capillaries and spaces between the endothelial cells and liver cells. It would seem, therefore, that excluding the cause of smallpox, that these areas are caused by the soluble products of the secondary invader, the streptococcus pyogenes.

Figure 2 shows a typical area of central necrosis. At "a" the normal liver structure is seen, while "b" shows the outer zone of necrosis in which many liver cells can be made

out in various stages of degeneration. Remains of the protoplasm and nucleus can still be made out. At "c" the central zone of complete structureless necrosis with intense nuclear fragmentation can be made out.

MICROSCOPIC EXAMINATION OF THE KIDNEY.

Extensive changes were found in every kidney examined.

In one case the acute interstitial nephritis, described by Councilman[5] in cases of scarlet fever and diphtheria, was found. The kidneys were enlarged, and the tubules were separated from each other by cellular infiltration. This infiltration also often surrounded the glomeruli outside of the capsule. These cells are not leucocytes, but are much larger, and the nucleus stains very deeply and is usually placed excentrically at either end of the cell. Councilman believes that in some way these cells are derived from the small blood vessels, as they are often found within these vessels. He also thinks that their irregular shapes indicate that they are ameboid, and he identifies them as Unna's plasma cells. According to him they are large lymphocytes, and they emigrate from the vessels in acute interstitial inflammation of the kidney. They are very numerous in the spleen and bone marrow, and are probably found principally in these situations.

In one very malignant confluent case the kidney was the seat of most interesting lesions.

On looking at some of the glomeruli, with the low power, they seem partially changed into hyaline masses, and the high power shows that this condition is due to numerous large or small droplets of a clear hyaline material within the lumen of the capillaries. This condition is apparently due to an actual degeneration of the endothelial cells of the glomerular capillaries, since many of these can be seen in the various stages of degeneration. The nuclei seem to swell and take up a much paler stain than normal, and the

cytoplasm breaks up into round hyaline droplets of various sizes, which often coalesce into large confluent drops, apparently obstructing and distending the capillary lumen.

Sometimes the chromatin of degenerating endothelial cells becomes increased in amount and granular.

The epithelial cells lining the capsular space also frequently proliferate, which compresses the capillary network into an irregular mass. They can be distinguished from the endothelial cells of the capillaries by their larger vesicular more lightly staining nuclei, and by the greater amount of eosin-staining cytoplasm. These proliferating capsular endothelial cells show a great tendency towards hyaline degeneration, which seems to begin by an increase in size of the nucleus, while the cytoplasm turns to round hyaline drops of various sizes. The nucleus takes on a paler stain with haematoxylon, and finally disappears in the hyaline material, which becomes confluent, forming large round or oval drops.

Sometimes the hyaline material forms a large crescentic mass of homogeneous clear material in the capsular space.

The epithelium of the convoluted tubules is swollen, and the cytoplasm of the cells contains numerous granules. Many of the cells, however, have undergone a much greater change. The cytoplasm is completely transformed into a mass of clear droplets of about the average size of from three to ten times the diameter of a micrococcus. The nuclei are usually well preserved, although the cells are often swollen to about twice their natural size, and simply consist of a mass of granules. These degenerated cells finally break up and the granules become free in the lumen of the tubule. Here they seem to coalesce into hyaline casts. The limbs of Henle are often distended and filled by casts of clear hyaline material. These areas of degeneration do not stain by Van Gieson's stain, and are therefore not true hyaline. When stained by Weigert's fibrin stain, however, both the clear droplets and the casts take up a deep purple stain.

This is the reaction for fibrin, and the degeneration must be of a fibrinoid character. The formation of the hyaline casts from the degenerated cells can also be clearly made out, as many purple droplets are seen gradually coalescing to form casts taking the same stain. This is of interest concerning the somewhat doubtful origin of hyaline casts, and it would seem clear that in this instance they were formed from degenerated cells of the tubules undergoing fibrinous change. The formation of casts from somewhat similar large droplets has been described by Councilman and Mallory in diphtheria. These large droplets in the degenerated tubular epithelium of the cortex stain a deep blue color by Mallory's connective tissue stain, and the hyaline casts present stained also blue by this stain. Councilman and Mallory think that both the hyaline and granular casts are formed from these products of cell destruction.

When these degenerated cells are stained by osmic acid, and then counterstained by safronin, eosin or other stains, many of the smaller granules take up the black fat stain, but many remain colored by the safronin or eosin.

There are therefore fatty and fibrinous changes side by side in the same cell.

Figure 3 shows the lesion of acute interstitial nephritis under the low power. At "a" the cellular infiltration can be made out surrounding several convoluted tubules, and at "b" several glomeruli can be made out in the midst of an area of intense cellular invasion. This picture can be viewed with advantage by using a hand lens. Figure 4 shows the same condition under a higher power. In the centre of the photograph at "a", there is an atrophied, compressed glomerulus completely surrounded by the cellular exudation of plasma cells. This exudation also separates many of the convoluted tubules from each other.

Figure 5 shows the degeneration of the epithelial cells of the tubules very well. The specimen was first stained by eosin, and then by Weigert's fibrin stain, and the cytoplasm

is broken up into the large granules seen in the picture. These granules usually take up a deep blue stain by this method, thus giving the reaction for fibrin. The tubule marked "a" shows this degeneration, and at "b" a degenerated cell can be seen whose nucleus is still present. At "c" the tubule contains many desquamated, degenerated cells free in the lumen. Many of these cells have lost their nuclei, and some of them show the granules mentioned above. Figure 6 shows a similar condition, and at "a" the tubule contains a granular cast which in the stained Weigert specimen takes up a light blue stain. It seems that these granules gradually coalesce into casts of a hyaline or granular nature.

CHANGES IN THE SPLEEN AND OTHER VISCERA.

The spleen was large and soft in two cases, and of normal size and consistency in three instances. Microscopically, nothing was found except acute congestion of the splenic spaces. The stomach, small intestines, large intestines, bladder, diaphragm, voluntary muscles, and pancreas were normal in those cases examined. The granular layer of the medulla of the adrenal gland in one case contained areas of cellular infiltration without necrosis. These consisted of small lymphocytes and cells of an endothelial type.

LESIONS IN THE SKIN.

No lesions of the skin were noted which have not been previously described, but the primary exudation of plasma cells has not been especially emphasized in Unna's description. These plasma cells are probably derived in part by proliferation from the endothelium of the lymph spaces and lymph vessels.

In some of the sections made from very early cases, the epithelial cells do not show any great injury, but the cutis is swollen, and there is an increased number of plasma cells in

the lymph spaces, and around the small blood vessels. The condition resembles the response to some injury, and seems to be the first change in the skin, since the various changes in the epithelial cells are not yet present. Some of these cells have an eccentric nucleus, and resemble the cells found by Councilman in the hyperplastic bone marrow in diphtheria. Other cells in these groups exactly resemble the endothelium of small vessels, and are probably derived from lymph spaces and small vessels by proliferation. The typical plasma cells are thought by Councilman to be emigrated large lymphocytes.

Figure 7 shows the primary cellular infiltration which seems to precede the injury to the epithelial cells. At "a" can be seen a normal layer of epidermis, and beneath this in the corium at "b" there is a large collection of the so-called plasma cells. Smaller groups are scattered through the corium at other points, and since the epithelial cells show no injury, this cellular infiltration seems to represent the primary lesion of the skin.

The next change in the earliest lesions was edema and swelling of the epithelial cells, followed by contraction of the nucleus. This often became fragmented and broken up into small granular masses. The exudation of leucocytes and serum, and the liquefaction of the epithelial cells was also observed.

The various changes in the epithelial cells are well shown in the photomicrographs. Figure 8 begins a series showing the injury to the epithelial cells, and would correspond to the early papular stage of the eruption. At "a" various stages of nuclear atrophy and fragmentation can be made out, and at "b" the great edema and liquefaction of the cytoplasm of cells appears. This is the ballooning process of Unna. The process begins in the stratum lucidum and stratum granulosum. Figure 9 simply shows a continuation of the same process. Figure 10 shows a curious degeneration of the epithelial cells of the stratum granulosum. The

nuclei are shriveled and the surrounding cytoplasm is broken up into circular clear masses resembling fat drops. At "a" the phantom-like outline of these globular, clear masses can be well made out, and this degeneration seems to be a further process in the formation of the vesicle. Figure 11 shows a vesicle originally filled with a clear fluid. At "a," the junction of the stratum lucidum and the stratum granulosum, the layer of epidermis has split, and the layers pass above and below the fluid contents of the vesicle. Several hair follicles are seen at "b," and "c" shows that the corium is free from any participation in the vesicle. Figure 12 shows a smallpox pustule, which has ruptured the lower enveloping layer of epidermal cells. Many neutrophilic cells have thus escaped, and have infiltrated the corium. Such accidents account for the scar formation following smallpox, or the so-called pitting, since the scar must form when fibrous tissue regenerates after inflammation. "A" shows the pustule which has ruptured at "b," and "c" indicates the corium richly infiltrated with neutrophilic leucocytes, and an edematous albuminous fluid. Figure 13 is taken from a section made directly through the area of umbilication in a pustule. It shows very well that the umbilication is simply produced by an edema and purulent infiltration of the sides of the pustule causing a bulging, while the central portion of the pustule, which shows little edema, remains as a depressed centre. At "a," the layers of epidermis are separated by a purulent edematous fluid, and at "b" the exudation is entirely purulent. The central or depressed area of umbilication at "c" shows very little change, and at "d" the lower layer of epidermis has not ruptured, showing a normal subcutaneous layer at "e." The crater-like depression of umbilication is well shown. Figure 14 shows a mass of interlacing filaments of fibrin, including pus cells within the meshwork. This exudation of fibrin is often seen in smallpox pustules, especially when there is a mixed streptococcus infection. At "a" the network of fibrin is seen ending abruptly at "b," the corium.

In the hemorrhagic case, the cells of the stratum granulosum showed various stages of nuclear degeneration, and the edema of the cytoplasm with typical ballooning was observed. The capillaries and lymph spaces of the corium were greatly distended by red blood corpuscles, and numerous hemorrhages were present in the connective tissue. The epidermis was not invaded by red blood corpuscles.

CHANGES IN THE TESTICLE.

Necrotic changes were noted in the testicle in two cases, and the various stages could be well traced out. The process seemed to begin by a necrosis of the epithelial cells of the seminiferous tubules. The nuclei of these cells showed marked karyorhexis, and the protoplasm of the many cells was necrotic and granular. In the later stages, large areas of necrosis can be seen to particularly consist of seminiferous tubules which have coalesced into masses with central areas of coagulative necrosis, with nuclear fragmentation, surrounded by a thick zone of necrotic cells. The intertubular connective tissue is thickened, and even the walls of the arteries have undergone necrosis with nuclear fragmentation.

Figure 15 is a good representation of the necrotic areas found in the testicle. At "a", a few normal seminiferous tubules are present, which at "b" are gradually undergoing necrosis, with loss of contour. The area marked "c" consists of a necrotic mass of coagulative necrosis with much nuclear fragmentation. Figure 16 at "a" shows the seminiferous tubules under a higher power, and many of the epithelial cells show fragmentation or loss of their nuclei. The gradual transition of these injured tubules into necrotic material is also well shown.

SECONDARY BACTERIAL INFECTION.

This is a point of general importance, as the rapid advance of serum therapy towards a remedy for combating septicemia bears directly upon this matter.

It is now well known that many typhoid cases, and perhaps the majority of the eruptive fevers, die not so much from the primary cause, as from secondary infection with the streptococcus pyogenes.

This streptococcus infection is the most striking feature of fatal smallpox, and the course of infection can be traced from the skin to the general circulation.

As mentioned above, the cultures from vesicles in early and mild cases of smallpox remained sterile, but after the secondary fever the pustules often contain streptococci in abundance.

Four of our fatal cases contained streptococci in the pustules, and various viscera, such as the heart, liver, kidney, spleen, lymph glands, pancreas and lung. One showed a general infection with the staphylococcus pyogenes aureus.

On staining by Weigert's stain for bacteria, streptococci could be demonstrated in the pustules of the skin, and in the lymph spaces of the corium.

From this point they are carried to the lymphatic glands by the lymph current, and stained sections from the cervical and bronchial glands gave a remarkable picture.

In the cortex of the glands, usually just beneath the capsule, there were extensive focal necroses. The lymph-sinuses were greatly distended, and the necrotic areas often contain neutrophilic leucocytes. When these glands are stained by Weigert's method, many of the necrotic areas are seen to consist almost entirely of masses of streptococci. There are also many streptococci in the lymph sinuses of the glands. The arteries and capillaries also contain streptococci, and there are fibrinous thrombi in many of the lymph channels of smaller glands. This condition was found in the cervical and bronchial glands, showing the absorption of streptococci from the pustules of the skin, and the diseased mucous membrane of the bronchus.

These organisms then enter the general circulation, causing general septicemia, and bacteria were demonstrated in stained sections from the kidney, liver, lung, and testicle. The bacteria were in the necrotic areas of the lung, and also in the interlobular capillaries of the kidney, the lymph spaces of the portal system, the capillaries of the liver, the perivascular lymph spaces of the lung, the necrotic epithelium of the bronchi, and the veins and lymph spaces of the thymus gland, which also contained thrombi. The presence of the pyogenic bacteria in the skin and lymphatic glands has already been mentioned.

Ewing[6] found streptococci in the heart's blood in 29 cases of smallpox, and Arnaud[7] obtained this organism in two cases from the blood of the heart during life.

TENDENCY TOWARDS GENERAL THROMBOSIS.

Many of the viscera contain fibrinous thrombi in the small blood vessels and lymphatics, and these lesions are usually very pronounced in the blood vessels of the lung, spleen and lymphatic glands. Large masses of fibrin are very frequent in the vessels of these viscera, and Figure 17 shows the beginning of fibrin formation and thrombosis in a blood vessel of the lung. The strands of fibrin are well shown at "a," and at "b" lymphocytes and neutrophilic leucocytes are to be observed. "C" shows the mass of red blood corpuscles and "d" the open spaces of surrounding air cells. Figure 18 is a photograph of a lymphatic gland, and at "a" the fine network of a fibrinous thrombus of a lymphatic vessel can be seen. Figure 19 shows a collection of short chains of streptococci into masses, and represents a very frequent picture in smallpox sections. The large masses of organisms found in various viscera are often startling, and they might almost be described as emboli of micro-organisms. The photomicrograph was made from an area of thrombosis in a vessel in the lung, and shows the micrococci collecting into masses resembling the agglutination of other organisms.

SUMMARY.

Although we have only studied five cases of smallpox, yet some conclusions can be drawn from the work.

The early skin lesions indicate that the primary infection in smallpox takes place in the lungs, probably by inhalation. The poison, when it enters the circulation, shows a selective influence on the epithelium of the skin and respiratory tract, and many cases are probably not further affected.

The serious and fatal lesions of smallpox are caused by the secondary infection from the skin and respiratory tract, and the infectious agent is usually the streptococcus pyogenes. This organism is so distributed throughout the lesions as to explain most of the visceral changes, such as local necrosis, and the various pulmonary changes.

This streptococcic septicemia is the most striking feature of fatal smallpox, and if it were possible to overcome this condition by a special serum, the mortality from the disease would be greatly reduced.

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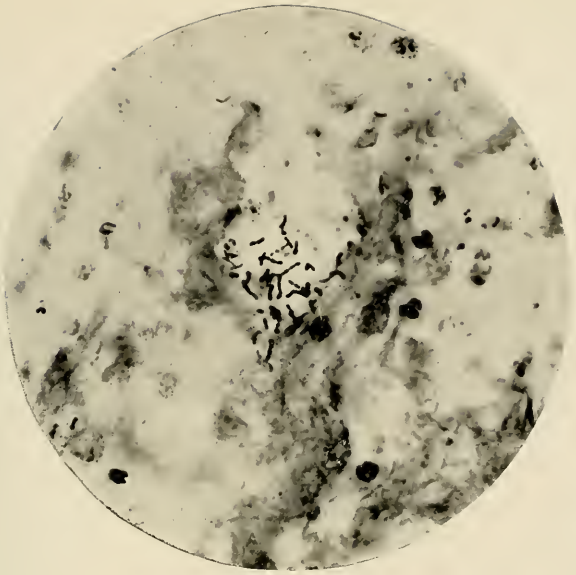

FIG 1

FIG. 1a

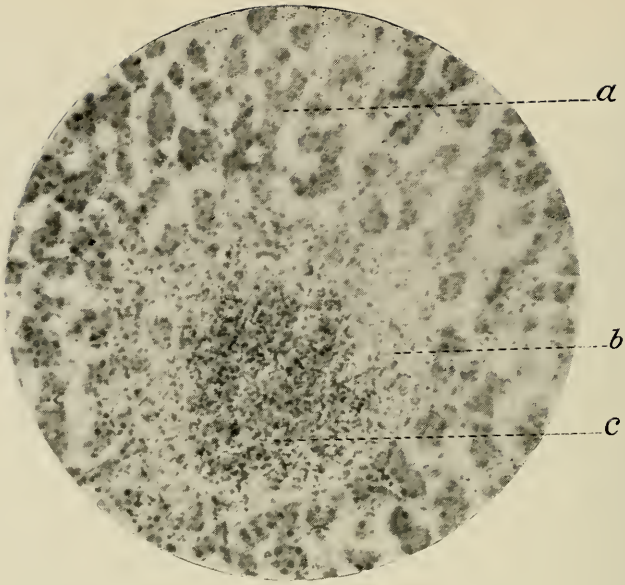

FIG. 2

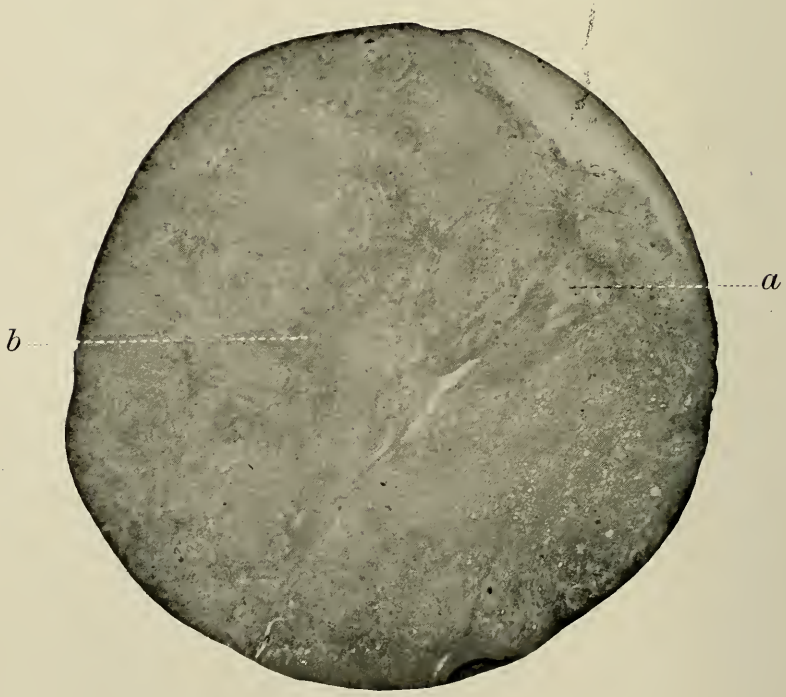

FIG. 3

6. Ewing. Transactions of Association of American Phys. 1902, p. 208.

7. Arnaud. Rev. de Med. 1900, p. 303.

OTHER LITERATURE.

E. Wagner. Archiv. f. Heikunde. Bd. XIII. Immerman. Nothnagel's specielle Path. und Therapie. Band IV, No. 2.

DESCRIPTION OF PHOTOMICROGRAPHS.

Figure 1. Section of lung of smallpox case showing a purulent exudation in an air cell containing streptococci.—*Dr. C. H. Potter.*

Figure 1 a. Section of lung and pleural surface showing large spaces on the pleural surface filled originally with fluid. These pseudo-vesicles of the pleura are shown at "a," and "b" indicates the normal lung tissue.—*Dr. C. H. Potter.*

Figure 2. Section of liver showing a typical area of central necrosis. The zone at "a" shows the rows of liver cells separated by capillaries, and "b" shows the outer area of necrotic liver cells in various stages of destruction. At "c" the complete structureless zone of necrosis can be made out. —*Dr. C. H. Potter.*

Figure 3. Section of kidney under low power showing areas of cellular infiltration especially marked at "a" and "b." At "a" a large area of cellular infiltration around several convoluted tubules can be made out, showing the lesion of acute interstitial nephritis.

Figure 4. Section of kidney showing acute interstitial nephritis under a higher power. At "a" a large group of plasma cells are seen surrounding a glomerulus and separating several tubules from each other.—*Dr. C. H. Potter.*

Figure 5. Section of kidney showing the special fibrinous degeneration of the epithelium of the convoluted tubules. "A" indicates the granules in the degenerated cells staining by Weigert's method, and at "b" a cell almost entirely degenerated is seen. At "c" a number of degenerated epithelial cells in the lumen of a tubule can be seen, and many of these cells contain these granules.—*Dr. C. H. Potter.*

Figure 6. Section of the cortex of the kidney showing the same degeneration as Fig. 5. At "a" a cast which stained by the fibrin stain is seen, showing the formation of the casts from these granular bodies.—*Dr. C. H. Potter.*

Figure 7. Section of the skin showing the primary infiltration of the corium by the plasma cells. This is shown at "b", and "a" demonstrates that the epithelium is not yet injured.—*Dr. J. S. Fulton.*

Figure 8. Section through the epidermis in the papular stage. At "a" various stages of nuclear atrophy and fragmentation are seen, and at "b" the great edema and liquefaction of the cytoplasm of the cells can be made out. This is an example of the earliest epidermal changes in smallpox. The change in the cells at "b" is called the ballooning process, owing to the distended condition of the swollen cells.—*Dr. C. H. Potter.*

Figure 9. Section through the epidermis. This shows a continuation of the process described in Figure 8. The various layers of the epidermis are shown in various stages of degeneration, and some of the cells are swollen to about three times their normal size, and the granular cytoplasm is replaced by a clear fluid. Some of the nuclei are present, but many of the epithelial cells have lost their nuclei. This is the stage which precedes the vesicular stage.—*Dr. C. H. Potter.*

FIG. 4

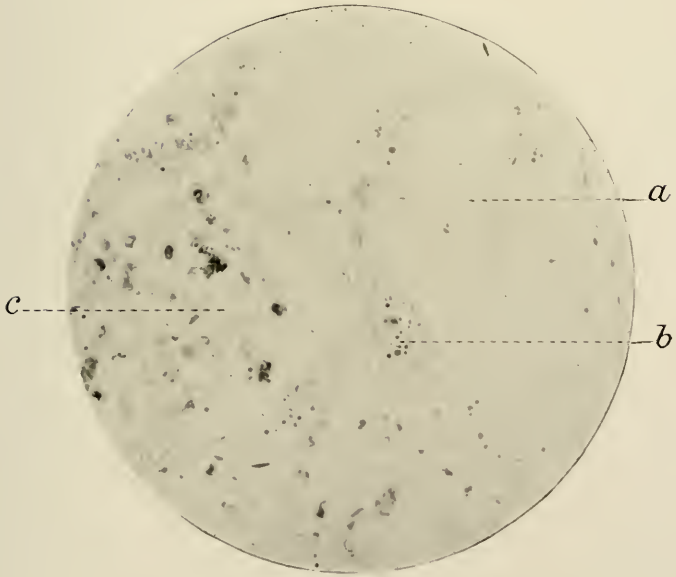

FIG. 5

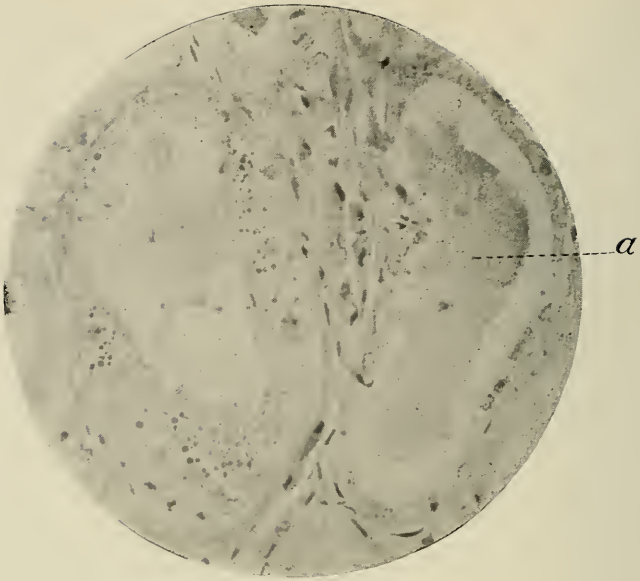

FIG. 6.

FIG. 7

Figure 10. Section through the epidermis showing a curious degeneration of the cells. The nuclei are shriveled, and the cytoplasm surrounding the nuclei is broken up into circular masses like fat drops. At "a" the phantom outline of these globular masses can be seen, while in the upper part of the picture the epithelium shows normal nuclei and cytoplasm.—*Dr. C. H. Potter.*

Figure 11. Section through the skin showing a vesicle originally filled with a clear fluid. At "a," the junction of the stratum lucidum and the stratum granulosum, the layer of epidermis has split, and the layers pass above and below the fluid contents of the vesicle. This thin layer is unruptured, and the corium at "c" shows no infiltration. At "b" several hair follicles are seen.—*Dr. C. H. Potter.*

Figure 12. Section of a pustule which has ruptured at "b," where the break in the rete Malpighii can be seen. "A" shows the pustular contents of the pustule, and "c" indicates the intense purulent infiltration of the corium. This explains the pitting, as in these cases the scar must always follow the inflammation of connective tissue, while the unruptured pustule will regenerate its epitheilum without scar formation. The adjacent normal epithelium can be seen at the upper portion of the picture.—*Dr. C. H. Potter.*

Figure 13. Section through the central portion of a pustule showing the phenomenon of umbilication. The crater-like depression is seen at "c," and below this the various layers of the epidermis show very little swelling, edema or other changes. The edema and purulent infiltration to either side can be well seen. At "a" the layers of epidermis are separated by a sero-purulent fluid, and at "b" the exudation is entirely purulent. At "d" the lower layer of the epidermis is unruptured, and the corium shows no infiltration. This section shows the reason for umbilication very well.—*Dr. C. H. Potter.*

Figure 14. Section at the base of a pustule just adjacent to the corium. This shows the fibrinous network, including pus cells often seen in pustules. At "a" this network is shown, and "b" shows a corium infiltrated by plasma cells. At the lower portion of the section a small vessel surrounded by plasma cells is seen.—*Dr. C. H. Potter.*

Figure 15. Section of testicle showing the necrotic areas. "A" indicates the fairly normal seminiferous tubules, "b" the tubules undergoing necrosis and destruction, and "c" shows the completely necrotic zone with intense nuclear fragmentation.—*Dr. C. H. Potter.*

Figure 16. Section of testicle under a high power, showing at "a" the remains of tubules which have undergone partial necrosis. Their outline as tubules can still be made out, but their gradual transition into necrotic material can be well seen.—*Dr. C. H. Potter.*

Figure 17. Section of lung showing the beginning of thrombosis in a blood vessel. The strands of fibrin are well shown at "a," and "b" shows a few leucocytes. "C" shows a mass of red blood corpuscles, and "d" shows a clear air vesicle.—*Dr. J. S. Fulton.*

Figure 18. Section of lymphatic gland showing at "a" a thrombus consisting of a fine reticulum of fibrin in a lymphatic vessel. The normal lymphocytes are well shown.

Figure 19. This simply shows a large mass of micrococci in a thrombus in the lung. It is meant to show the very large emboli of organisms which often form in the vessels and tissues in smallpox.

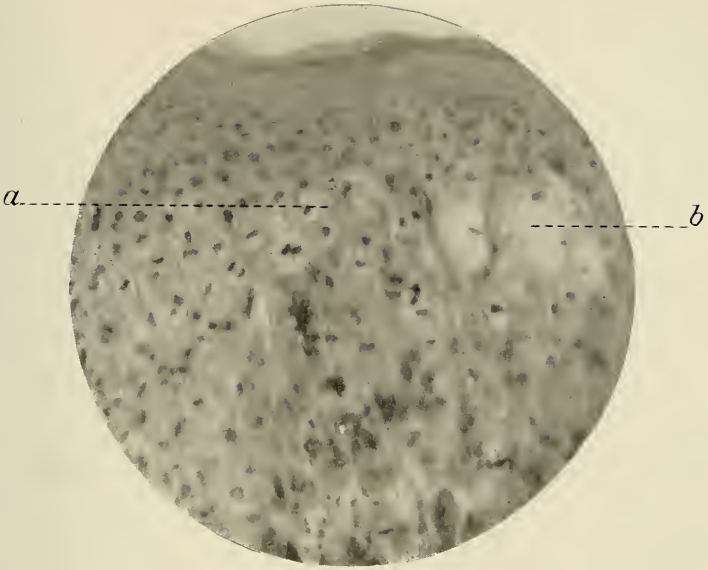

FIG. 8

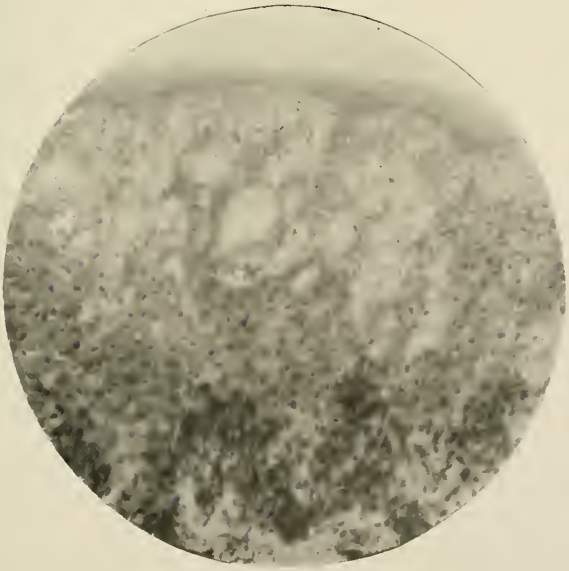

FIG. 9

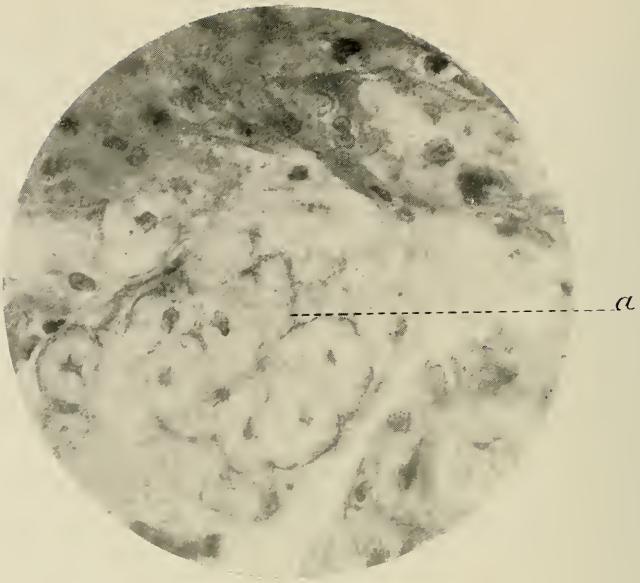

FIG. 10

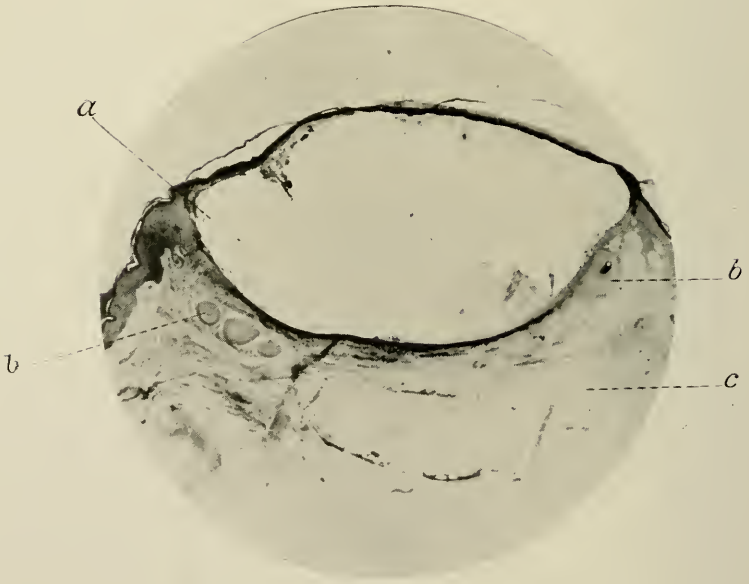

FIG. 11

REPORT.

BALTIMORE, January 1st, 1903.

DR. JAMES BOSLEY,

Commissioner of Health.

DEAR SIR—I hereby respectfully submit my report of the work performed in the Bacteriological Laboratory of the Sub-Department of Health for the year ending December 31st, 1902.

BACTERIOLOGICAL EXAMINATION OF THE WATER SUPPLY.

Report upon the City Water Supply for the Past Year:

The city water has been repeatedly examined, together with a number of wells and springs. A number of examinations have also been made of the various sources of supply, including the reservoirs and streams. These tests consist in the numerical estimation of the bacteria present in 1 cubic centimeter of water and the tests for the presence of the colon bacillus or intestinal germ.

In order to explain the work upon the water, I have printed the following description of the source of our water supply from a letter kindly sent by Water Engineer Alfred M. Quick:

"Our water supply is derived from two sources, Jones' Falls and Gunpowder River. The Jones' Falls supply is impounded in Lake Roland by a dam near Hollins Station, on the Northern Central Railroad, and the water is sent by gravity from there through a conduit about 4 miles long to

Hampden Reservoir in the city. From Hampden Reservoir the water flows by gravity through 30-inch pipes to Druid Lake, and from Druid Lake water is supplied by gravity to the consumers in the Middle Service.

"The Gunpowder River supply is impounded in Loch Raven by a dam near Loch Raven Station on the Maryland and Pennsylvania Railroad, and the water is sent by gravity from there through a tunnel about 7 miles long to Lake Montebello. From Lake Montebello the water flows through a tunnel about a mile long to Lake Clifton, and from Lake Clifton consumers in the Low Service are supplied by gravity, and consumers in the High Service are supplied by pumping from the Eastern and Mt. Royal Pumping Stations.

"The Upper Service is supplied by the Western Pumping Station in Druid Hill Park, taking water from Druid Lake and pumping to the Standpipe at West Arlington."

Tables No. 1, 1 a and 1 b, which follow at the end of the report at page 89, will show the work in detail on the tap water, the wells and springs, and the reservoirs and streams.

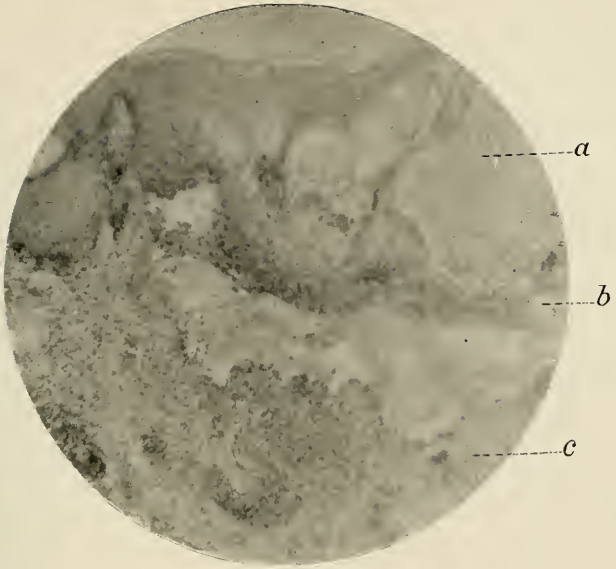

FIG. 12

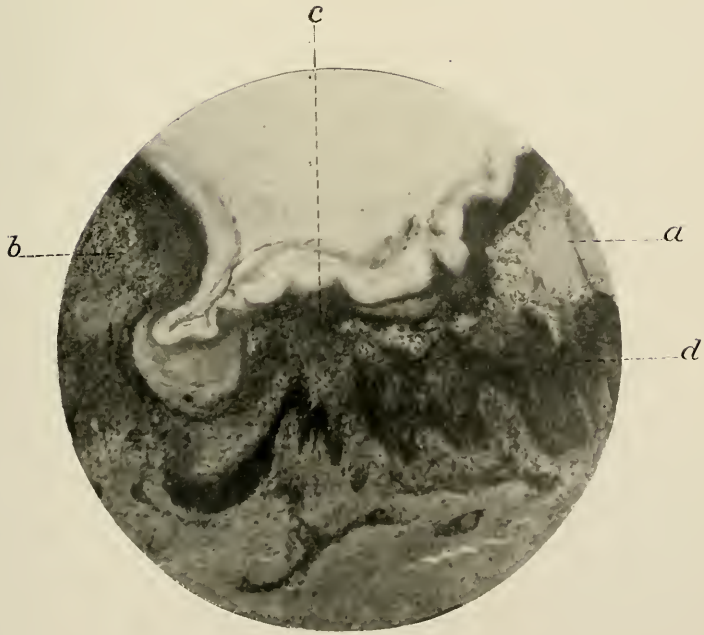

FIG. 13

FIG. 14

FIG. 15

TABLE No. 1.

EXAMINATION OF TAP WATER.

TAP WATER.	Date.	COLONIES PER C. C.		Colon Bacillus.	Condition.
		Aerobic.	Anaerobic.		
Laboratory tap	Jan. 27.	2,160	0	Negative in 1 and 50 C. C..	Good.
Laboratory tap	Feb. 14.	14,640	94	Negative in 1 and 50 C. C..	Good.
Ward 15—1723 West North avenue	" 27.	.....	80	Present in 1 and 50 C. C...	Bad.
Ward 17—601 Pennsylvania avenue	" 27.	....	58	Present in 50 C. C	Bad.
Ward 20—1916 West Pratt street	" 27.	.....	70	Negative in 1 and 50 C. C..	Good.
Ward 21—1110 South Paca street	" 27.	3,840	11	Negative in 1 and 50 C. C..	Good.
Ward 22—128 West Conway street	" 27.	3,900	0	Negative in 1 and 50 C. C..	Good.
Ward 23—1508 South Charles street	" 27.	3,780	0	Negative in 1 and 50 C. C..	Good.
Ward 24—1417 Riverside avenue	" 27.	.....	0	Negative in 1 and 50 C. C..	Good.
Ward 13—248 Roland avenue	" 28.	... .	0	Negative in 1 and 50 C. C..	Good.
Laboratory tap	March 12.	1,461 Gel.. 852 Agar	0	Present in 1 and 50 C. C...	Bad.
Laboratory tap	April 10.	1,130 Gel.. 1,740 Agar	21	Negative in 1 and 50 C. C..	Fair.
Laboratory tap	May 21.	588	157	Present in 1 C. C.....	Bad.
Laboratory filter—3 weeks' use	" 29.	8,400	0	Negative.....	Bad.
Laboratory tap	June 28.	1,350	98	Negative.....	Fair.
1613 Hopkins avenue	July 10.	150	120	Negative.....	Good.
Laboratory tap—Raw water	Aug. 31.	135	34	Negative.....	Good.
Filtered water—Lab. filter	" 31.	50	15	Negative	Good.

TABLE No. 1—Continued.

EXAMINATION OF TAP WATER.

TAP WATER.	Date.	COLONIES PER C. C.		Colon Bacillus.	Condition.
		Acrobic.	Anaerobic.		
Filter from Dr. B's	Sept. 16.	15	0	Negative	Good.
Laboratory tap	" 22.	685	8	Negative	Good.
Court House filter	" 24.	263	31	Negative	Good.
215 North Chester street—Tap	" 24.	7560	820	Negative	Bad.
Laboratory tap	" 24.	1090	300	Negative	Fair.
Laboratory tap	" 25.	860	250	Negative	Fair.
Laboratory tap	" 29.	50	10	Negative	Good.
Court House—Raw water	Oct. 4.	620	0	Present in 1 C. C.	Bad.
City tap	" 11.	1000	300	Present in 1 C. C.	Bad.
Laboratory tap	Nov. 10.	690	62	Present in 1 C. C.	Bad.
Laboratory filter	" 10.	780	1	Present in 1 C. C.	Bad.
411 West Conway street—Tap	" 20.	90	1	Present in 1 C. C.	Bad.

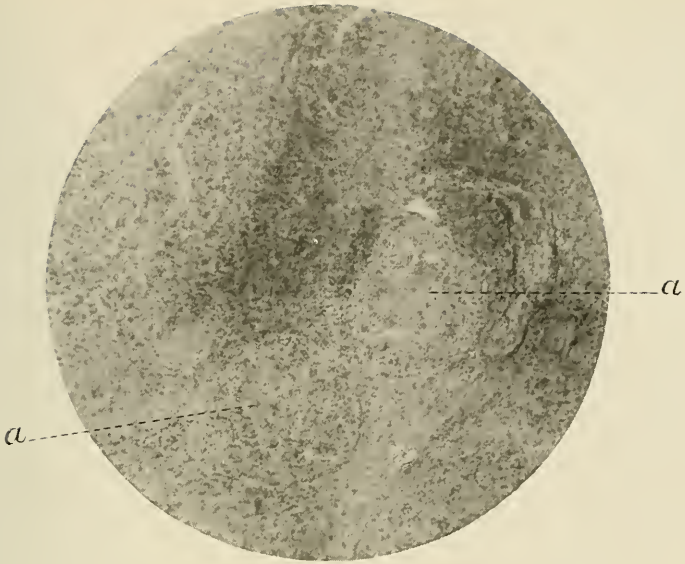

FIG. 16

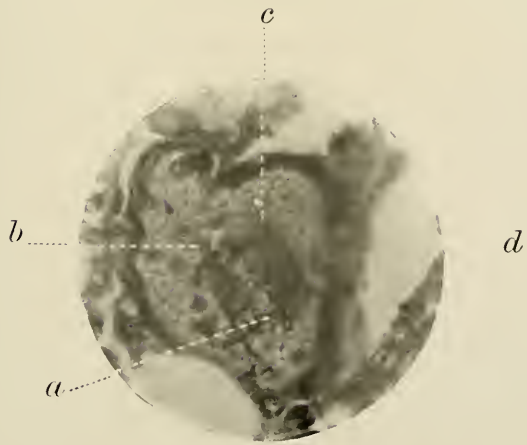

FIG. 17

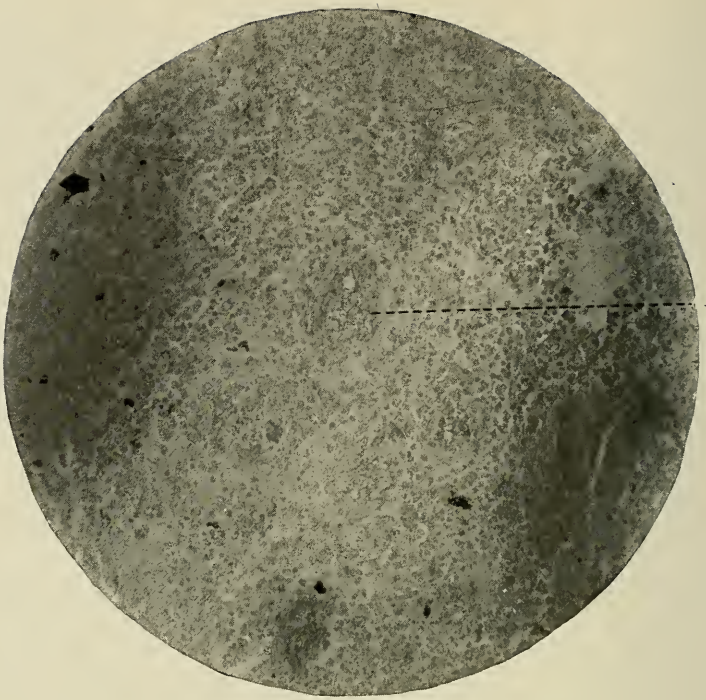

FIG. 13

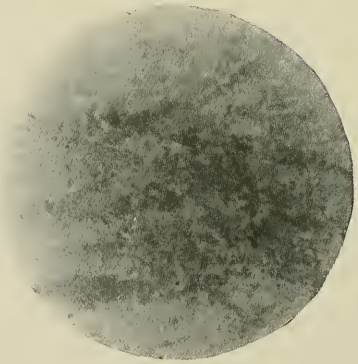

FIG. 19

TABLE No. 1 A.

EXAMINATION OF WELLS AND SPRINGS.

WELLS AND SPRINGS.	Date.	COLONIES PER C. C.		Colon Bacillus.	Condition.
		Aerobic.	Anaerobic.		
Wyman's Estate, Spring	June 13.	15,000	600	Present in 1 C. C.	Bad.
200 Hickory avenue, Pump	" 14.	35	5	Present in 1 and 50 C. C.	Bad.
111 Stafford street, Well	July 10.	100	1	Present in 1 and 50 C. C.	Bad.
Oak and Twenty-seventh street, Pump.	" 15.	350	80	Present in 1 and 50 C. C.	Bad.
2852 Pennsylvania avenue, Pump	" 19.			Present in 1 and 50 C. C.	Bad.
Reservoir street, Druid Hill Park	" 31.	3	1	Negative	Good.
Fred. Hemp, Gelston Heights, Franklin road, Pump	" 31.	250	50	Negative	Good.
John Burley, Franklin road, Pump	" 31.	500	70	Present in 1 and 50 C. C.	Bad.
George Knoop's Farm, Edmondson avenue, Pump	" 31.	5,000	600	Present in 1 and 50 C. C.	Bad.
H. Gelston, Gelston Heights, Well	" 31.	250	8	Negative	Good.
G. W. S. Jackson, Franklin road, Well.	" 31.	2,000	500	Present in 1 and 50 C. C.	Bad.
W. S. Whitely, Gilmor lane, Well.	Sept. 9.	750	350	Present in 1 and 50 C. C.	Bad.
Mr. Hardingham, 242 Sycamore avenue, Pump	" 16.	220	12	Present in 50 C. C	Bad.
Mr. Myers, 244 Sycamore ave., Pump.	" 16.	360	44	Present in 50 C. C	Bad.
Wm. White, 246 Sycamore ave., Pump.	" 16.	840	12	Present in 1 C. C	Bad.
2500 North avenue, Pump	" 24.	225	28	Negative	Good.

TABLE No. 1 B.

EXAMINATION OF RESERVOIRS AND STREAMS.

RESERVOIRS AND STREAMS.	Date.	COLONIES PER C. C.		Colon Bacillus.	Condition.
		Aerobic.	Anaerobic.		
Loch Raven	Oct. 22.	2,910	500	Negative	Fair.
Peterson's Race—3 Arch Bridge	" 22.	240	8	Negative	Good.
Loch Raven, below mouth of Peterson's Run	" 22.	5,400	220	Negative	Fair.
Loch Raven. Gate Chamber,	" 22.	6,000	.....	Negative	Fair.
Lake Montebello. Gate Chamber	Nov. 3.	4,800	124	Present in 1 C. C.	Bad.
Lake Montebello. Effluent at Gate Chamber	" 3.	870	both 7½ agar.	Present in 1 C. C.	Bad.
Lake Clifton. Influent at Gate Chamber		Gel. 1,500 Agar. 720	1,320 460	Negative	Good.
Lake Clifton. Effluent at Gate Chamber		Gel. 6,000 Agar. 540	480 360	Negative	Fair.
Lake Roland. Mouth of Roland Run	" 5.	1,872	24	Present in 50 C. C.	Bad.
Jones' Falls, above Railroad Bridge	" 5.	960	84	Negative	Fair.
Towson Run, above Back Water	" 5.	756	156	Present in 1 C. C.	Bad.
Ellicott's Run at Railroad Culvert	" 5.	758	240	Negative	Fair.
Lake Roland at Gate House	" 5.	420	48	Negative	Good.
Hampden Reservoir at Influent Chamber	" 11.	5,100	360	Present in 1 and 50 C. C.	Bad.
Hampden Reservoir at Gate House	" 11.	4,200	600	Present in 1 and 50 C. C.	Bad.
Druid Lake. Screen well	" 11.	6,000	500	Present in 50 C. C.	Bad.
Druid Lake at Influent	" 11.	6,000	100	Negative	Fair.

SUMMARY OF TABLES NO. 1, 1*a* AND 1*b*.

Table No. 1 shows that 16 wells were examined, of which 12 were bad and 4 good. The City water was examined as it flows from the laboratory tap and the taps in various wards in 30 instances, and the colon bacillus, or Bacillus coli communis, a proof of intestinal pollution, was found 9 times. The reservoirs and other sources of supply were examined 17 times, as the later part of the table will show. The colon bacillus was present in 7 samples.

Another interesting feature of these tables is the comparison between the bacterial counts of the water as it flows from the City taps and the water in the reservoirs and rivers. The average number of bacteria present in 25 samples of tap water was 2,643, and the average from 17 examinations of the sources of supply was 3,163. The discovery of the badly polluted spring in a place much used by the public and its being labeled prevented its further use.

In 7 samples of tap water which contained colon bacilli the presence of nitrites was detected 6 times, and this seems to generally mean the presence of intestinal pollution, when detected in small quantities of water.

EXAMINATION OF HOUSEHOLD FILTERS.

During the past year a number of examinations of mechanical household filters were made by Mr. E. H. Schorer, under the direction of the department.

The first series of examinations was made with Filter A, placed on the tap. The object of the tests was to see if a filter, which was sterilized and then dried each day, would remain efficient. Two filters were sterilized in the autoclave and then properly adjusted, and 3 liters (about 3 quarts) of water were filtered through each, and 1 c. c. was plated for the bacterial count. After using the filters No. 1 was plugged with cotton and again sterilized as above, but No. 2

was removed, plugged with sterile cotton and dried in the air for nearly 24 hours. The filters were used daily, filtering 3 liters each day. Plates were made, as the following table indicates:

TABLE A.

Days.....	1st.	2d.	3d.	7th.	48th.	49th.	53d.	54th.
Sterilized daily.	9	17	0	2	14	2	0	4

Bacteria per cubic centimeter.

Days.....	1st.	2d.	3d.	7th.	48th.	49th.	53d.	54th.
Sterilized once Dried daily...	9	9	6	8	0	1	6	0

Bacteria per cubic centimeter.

Such filters will remove the great majority of bacteria if small quantities of water are desired, as from 3 to 5 liters, will have most of the bacteria removed. The City water was giving an average of about 600 bacteria.

EXPERIMENT NO. 2—FILTER B.

This is a filter so arranged that the charcoal and cloth filters can be washed by reversing the current of water. About 5 liters were filtered daily, the flow of water through the filter being quite rapid. The current was reversed daily, so as to keep the filter at its greatest efficiency. The results follow:

Days.....	1st.	10th.	11th.	14th.	15th.
Filter. Bacteria per cubic centimeter.	48	60	100	87	16

City water. 500 bacteria.

This filter reduced the number of bacteria from 1-5 to 1-10, the number present in the raw water.

EXPERIMENT NO. 3.—FILTER B.

Same as No. 2, except that in reversing the current, water not only flows in the opposite direction, but water was also flushed into the part containing the cloth filter to cut off the sediment that had been deposited.

Days.....	1st.	2d.	4th.	10th.	16th.	22d.
Bacteria in 1,215	2,340	9,000	1,200	282	480	
Filtered water.....1,350	2,520					

City water. 1,090 bacteria per c. c.

This seems to show that the special scheme to wash the cloth filter daily stirred up a sediment that increased the bacteria even over the raw water. The first type of filter was examined after use for one year, during which time only one cleaning was given the filter. Five hundred and eighty-five and 510 colonies per c. c. on agar were found. The other counts were made on 1 per cent. acid gelatin.

EXPERIMENT NO. 4—DR. B'S FILTER.

This filter is so arranged that a sheet of rice paper, which can be easily replaced, is used to filter the water. To aid the paper in filtering, a small amount of powdered charcoal is so put into the filter that it will be collected on the rice paper. After one day's use the filter was germ-free. After seven day's use the filtered water contained 3,190 bacteria per c. c. Then a fresh supply of filtering material was put in the filter, and it was allowed to run two days. The counts then showed 9,120 and 9,600 bacteria. This shows that in order to keep the water germ-free the filtering material should be replaced every day.

EXPERIMENT NO. 5—FILTER D.

After three years and nine months' use the filter gave the following results:

Water before entering the Filter.....	640 600	Two estimations.
Water after passing through Sand Filter...	112 96	
Water after passing through both Filters ..	168 142	
Water from tap in Superintendent's Room.	92	

It is safer to boil the water after filtration, as none of the methods examined rendered the water continuously and absolutely sterile. All of these filters, however, give a fair percentage of removal. This work is incomplete at present, but further work will be done on this subject.

SUMMARY OF THE STUDY OF THE BALTIMORE DRINKING WATER FOR THE PAST SIX YEARS.

The routine examination of the drinking water was begun on January 1, 1897, and has continued until the present time. During this period a chemical and bacteriological examination of 495 waters has been made by the City Chemist and myself and the results recorded. The summary of these results will form the basis of the following paper on the water supply of Baltimore.

The Northwestern Police District, comprising Wards 14, 15, 16 and 17, contains about 292 wells, but is mainly supplied by the city supply. Many of these wells have been found polluted and the results are of interest. There are also a few pumps in other districts of the city. The chemist and myself have examined 181 of these pumps together, of which 100 were found polluted by intestinal bacteria, while only 81 were found pure. This shows that the sub-soil is polluted thoroughly.

The number of bacteria present in one cubic centimeter (15 drops) was often excessive. Pure well water certainly should not contain more than 1,000 bacteria to the cubic centimeter. Classifying the wells of Baltimore according to the standard of less than 1,000 bacteria per cubic centimeter, and more than 1,000 bacteria per cubic centimeter, it was found that 30 wells rose above this figure, and 225 wells fell below this standard.* The colon bacillus was found in 19 instances in the wells above 1,000, and 30 times in the wells under 1,000. The colon bacillus was present in 63 per cent.

*The difference between these numbers and those mentioned above means that definite comparative chemical and bacteriological reports were not always made.

of wells over 1,000, and in only 13 per cent. under 1,000, showing that the colon bacillus was more frequently present in wells having high bacterial counts.

It is very difficult to establish an arbitrary standard for the number of bacteria in wells. Franklin has examined a large number of deep Kent wells sunk in chalk, and in 73 cases the lowest count was 5 and the highest count was 96. It can be stated that very good well water usually contains from 5 to 50 bacteria to the cubic centimeter, and that good well water contains from 50 to 500. Sedimentation also plays a considerable part, as a well may contain thousands of bacteria on the first pumping after a period of disuse, and after the well is pumped out the count may fall below 100 bacteria per c. c.

The presence of the colon bacillus should condemn a well at once, and the presence, after continuous pumping, of over 1,000 bacteria per c. c. should render the well suspicious.

During the past six years a large number of examinations have been made of the rivers and streams supplying the city, the various impounding reservoirs, and the tap water from various sections of the city. The analysis of the results will therefore be divided into three sections, corresponding to these distinct portions of the general supply.

EXAMINATION OF RIVERS AND STREAMS.

The number of bacteria present in one cubic centimeter of river water is subject to great variations, even in the same river, if the samples are taken from different portions of the river.

The work of Jordan shows that the entrance of large amounts of sewage from cities or towns into rivers will cause a great increase in the bacteria, but that as the river recedes from the point of pollution the bacteria decrease in numbers.

His work consisted in a large series of examinations of the Illinois river, which receives the main portion of the sewage of Chicago from the Chicago river. The Chicago river is connected with the Desplaines river by a large drainage canal, and this river empties into the Illinois river. He found from one to thirty-one million bacteria in the sewage in the canal, and as high as 237 parts of chlorine per million. When this became mixed with the Illinois river water, the bacteria varied from about 500,000 to 11,000,000, and the chlorine was from about 50 to 100 parts per million. When the river reaches Grafton, the self purification is marked. The chlorine varies from one to 18 parts per million, and the bacteria vary from 1,000 to 45,000. Grafton is about 300 miles below the point where the first entrance of sewage takes place.

The average number of bacteria in the sewage was 1,245,000, and the chlorine was 119.2. At Grafton the average of bacteria was only 10,200, and the chlorine 18.3. Many examinations were made at many points along the river, and a progressive diminution was found in the number of bacteria and the amount of chlorine present. The purest part of the river showed an average of 4,800 bacteria, and this might be taken as a fair standard for the majority of surface rivers running through inhabited water sheds.

On the other hand, Franklin gives some very low bacterial counts from rivers before they pass through inhabited country from which pollutions might be obtained.

The river Rhone, above Lyons, only contained 75 bacteria per c. c., and the Isar above Munich contained 531. Below Munich, just after receiving the sewage from the principal sewer of the town, the count arose to 227,000, and 16 miles below Munich the count fell to 2,378, showing the influence of self purification. The Lake of Zurich only contains from 100 to 200 bacteria per c. c., and all pure lakes correspond to this condition.

The problem in Baltimore at present does not present all of the difficulties which Jordan's investigation involved, since no very large volumes of sewage from towns or cities enter the streams and rivers supplying Baltimore with drinking water.

The pollutions might be described as scattered and equally distributed over the entire source of supply, and the results of the examinations seem to bear this out.

The rivers and streams have been examined 51 times, and in 28 samples the number of bacteria have been over 5,000 to the cubic centimeter. In 23 instances these samples were found to contain colon bacilli, and in 21 of these colon bacilli specimens the bacteria were over 5,000 bacteria to the c. c. Only 2 of these samples were under 5,000.

Twenty-eight of the samples taken from the rivers furnishing the source of supply were free from intestinal pollution, and 21 samples were under 5,000 bacteria to the cubic centimeter. Only 7 were over 5,000.

It will be seen that the colon bacillus is more frequently present in water containing more than 5,000 bacteria than in water under 5,000 per cubic centimeter.

EXAMINATIONS OF RESERVOIRS.

The water from the various reservoirs was examined 37 times. Intestinal pollution was demonstrated in 14 samples, and of these 7 were over 5,000 bacteria to the cubic centimeter, and 7 under this standard.

Twenty-three specimens were free from the colon bacillus, and 4 of these were over 5,000, while 19 were under this limit.

This shows that the infected samples contained more bacteria than the pure specimens, although the large amount of water in the reservoirs, and the small number of examinations renders these figures of small value.

Sedimentation in reservoirs doubtless causes a favorable change in the turbidity of any water, and if prolonged the amount of dissolved organic matter will also decrease. The Thames water as it entered the storage reservoir contained 1,991 bacteria, but after it had been stored for a month the bacteria were reduced to 368 per cubic centimeter. Later a more striking reduction took place when the bacteria were reduced from 1,437 to 177 by sedimentation.

EXAMINATION OF THE TAP WATER OF THE CITY.

The tap water was examined 92 times, and the bacteria were so seldom over 5,000 bacteria to the cubic centimeter that it was thought more instructive to place the standard of comparison between the bacterial contents and the presence of the colon bacillus at 1,000 bacteria to the c. c.

The intestinal or colon bacillus was found 26 times, and only 3 samples contained more than 1,000 bacteria to the c. c. It was absent in 66 specimens of water, and 13 specimens were over 1,000.

The percentage over the standard in the polluted waters was 13.90, while this percentage in the pure samples was 19 per cent. There is no great difference between these two sets of figures.

INFLUENCE OF SEDIMENTATION UPON NUMBER OF BACTERIA.

In 46 examinations of the rivers and streams, the number of bacteria per cubic centimeter amounted to 791,400 bacteria, or an average of 17,204 per sample. In 168 examinations from the City tap water the average of the bacteria per cubic centimeter was only 693. This difference is probably caused by the sedimentation which takes place in the reservoirs, as it is well known that sedimentation and storage will decrease the number of bacteria in drinking water.

In 36 examinations from the small streams supplying the City the count ran even higher. The average from 36 ex-

aminations was 17,666 per c. c., and these small streams probably contribute largely to the pollution and general increased bacterial count on the water shed.

COMPARISON BETWEEN THE BACTERIOLOGICAL AND THE CHEMICAL EXAMINATION OF THE DRINKING WATER.

In order to study the relation between the presence of increased numbers of bacteria and the presence of the colon bacillus, and the increase of the various chemical products of decomposition, a comparative study of the results of both sets of examinations has been made.

The standard for chlorine adopted by the department is 6 parts per million in pure drinking water. The free ammonia should not exceed .05 per million, and the nitrates should not exceed 5.0 parts per million. There should be no nitrites present.

In 149 pumps examined for a comparison between the chlorine and the bacteriological condition in which the chlorine was over 6 parts per million, the colon bacillus was found in 58 samples and was absent in 91 specimens. In these 149 pumps the bacteria were over 1,000 in 33 cases, and under 1,000 in 116 cases.

This seems to show that many wells having a chlorine higher than the standard are not to be condemned from a bacteriological standpoint, but these are only condemned chemically when the chemical products of decomposition are all excessive, or any one is decidedly in excess.

In 61 pumps containing the colon bacillus nitrites were present 21 times, and absent 40 times. In 9 samples of city tap water containing the colon bacillus, nitrites were present 6 times and absent 3 times. In 78 pumps containing the colon bacillus the chlorine was over 10 parts per million in 74 instances, and in 95 pumps in which the colon bacillus was not detected the chlorine was over this point 69 times. In

71 pumps in which the colon bacillus was present, the nitrates were over 5 parts per million in 34 cases. In 82 cases in which colon bacillus was absent, the nitrates were over 5 parts per million in 33 waters.

In 62 wells in which the colon bacillus was found, the free ammonia was over 0.05 per million in 29 cases, and under this figure in 33 cases. In 99 cases in which the colon bacillus was absent, the ammonia was over 0.05 in 34 tests, and under this in 65 samples.

In 156 samples of pumps the bacteriological and chemical examination agreed in calling the samples good in 44 instances and bad in 52 tests. The chemical examination was good and the bacteriological examination bad in 17 tests, and the chemical examination was bad and the bacteriological examination good 43 times.

These figures show that neither a chemical nor a bacteriological examination alone can be entirely relied upon to prove the purity of well or spring water. The bacteria are particulate bodies and may not always be present in the especial small amount of water examined. A negative bacterial test is not conclusive unless combined with a chemical test. The chemical materials are soluble, and increased amounts of the chemical products of decomposition are evenly distributed through liquids, and are always detected. The chemical examination of small bodies of water give the best comparative results. On the other hand, these figures show that certain wells may contain the colon bacillus and yet not show increased chemical products. These are in the minority, but if only a chemical examination were made, these polluted wells would escape detection.

The chemical examination of the general supply maintains such an even figure that no comparative chemical and bacteriological figures were attempted. Usually when nitrites are detected in the water the colon bacillus is also found.

The very interesting set of averages in the report of the chemist shows a remarkable increase in the chlorine and nitrates in the City wells, and demonstrate a thorough saturation of the soil with the products of putrefaction and decomposition from our medieval system.

EXAMINATION OF BACTERIAL SPECIES IN THE WATER SUPPLY.

A few special species have been isolated from the City tap water, and Table No. 2 gives the result in tabular form. The various fermentation organisms have been classified according to general types, and the number of times each type was isolated is given in the tables. This table shows the presence of the usual types of saprophytic water bacteria, but also demonstrates the presence of certain pathogenic bacteria, such as Bacillus pyocyaneus, Bacillus proteus, Bacillus enteritidis and Bacillus coli communis. A bacillus resembling Bacillus typhosus was obtained, but did not give the Widal reaction with typhoid blood. It appears in the tables as Bacillus simultyphus. The different types of fermentative bacteria, which must be differentiated from Bacillus coli communis, are also of interest.

TABLE No. 2.

Showing Bacterial Species Isolated from the City Water.

Source.	Tap Water.	Tap Water.	Tap Water.
Name	Superficialis type.	B. Fluorescens.	Bacillus alkaligenes.
Morphology	Bacillus.	Short bacillus.	Short bacillus.
Gram's Stain	O	+	O
Motile	+	+	O
Spores	O	O	O
Appearance. Agar.			
Dull. Wrinkled. Moist	Dull.	Moist.	Moist.
Same. Bouillon	Alkaline.	Alkaline.	Alkaline.
Scum. Turbid. Sediment	Turbid.	Scum. Turbid.	Turbid.
Same. Potato			
Visible. Gas. Profuse	Profuse.	Profuse.	Not visible.
Aerobic. Anaerobic	Aer.	Aer.	Aer.
Glucose. Fermentation	O	O	O
Lactose. Fermentation	O	O	O
Saccharose. Fermentation	O	O	O
Grows at 37°C	+	+	+
Liquefaction	+	+	+
Gel. Casein. Serum	G. C. S.	G. C.	G. C. S.
Nitrate reduced	+	O	+
Indol	+	O	+
Milk. Reaction	Alkaline.	Acid.	Alkaline.
Coagulation	O	O	O
Odor	Fecal.	Fecal.	O
Chromogenesis	O	O	O
Fluorescence	O	+	O
Pathogenesis	O	O	O
Remarks			

TABLE No. 2—Continued.

Source.	Tap Water.	Tap Water.	Tap Water.
Name	Bacillus mycoides.	Bacillus mesentericus vulgatus.	Bacillus annulatus.
Morphology	Long, thick bacillus.	Long, thick bacillus.	Short bacillus.
Gram's Stain	+	+	O
Motile	O	O	+
Spores	+	+	O
Appearance. Agar			
Dull. Wrinkled. Moist	Dull.	Wrinkled.	Moist.
Same. Bouillon			
Scum. Turbid. Sediment	Scum.	Scum, turbid.	Turbid.
Same. Potato			
Visible. Gas. Profuse	Profuse.	Wrinkled.	Profuse.
Aerobic. Anaerobic	Aer. Anaer.	Aer. Anaer.	Aer.
Glucose. Fermentation	O	O	O
Lactose. Fermentation	O	O	O
Saccharose. Fermentation	O	O	O
Grows at 37°C	+	+	+
Liquefaction	+	+	+
Gel. Casein. Serum	G. C. S.	G. C. S.	G. C. S.
Nitrate reduced	+	+	+
Indol	O	O	+ (slight)
Milk. Reaction	Neutral.	Neutral.	Acid.
Coagulation	O	O	+
Odor	Stuffy.	Stuffy.	O
Chromogenesis	O	O	O
Fluorescence	O	O	O
Pathogenesis	O	O	O
	I. c. c. abd. cav. guinea pig.	I. c. c. abd. cav. guinea pig.	I. c. c. abd. cav. guinea pig.
Remarks		Isolated two times.	Isolated two times.

TABLE No. 2—Continued.

Showing Bacterial Species Isolated from the City Water.

Source.	Tap Water.	Tap Water.	Tap Water.
Name	Bacillus pyocyaneus.	Bacillus simultyphus.	Spirillum saprophiles.
Morphology	Long, thin.	Short bacillus.	Spirillum.
Gram's Stain	O	O	O
Motile	+	+	+
Spores	O		O
Appearance. Agar			
Dull. Wrinkled. Moist	Moist.	Dull.	Moist.
Same. Bouillon			
Scum. Turbid. Sediment	Turbid.	Turbid.	Turbid, scum, alkaline.
Same. Potato		Scum.	
Visible. Gas. Profuse	Profuse.	Profuse, yellow.	Profuse, yellow.
Aerobic. Anacrobic	Aer. Anaer.	Aer. Anaer.	Aer. Anaer.
Glucose. Fermentation	50% Acid. CO_2-1-H-2.	O	O
Lactose. Fermentation	Same.	O	O
Saccharose. Fermentation	O	O	O
Grows at 37° C	+	+	+
Liquefaction	+	O	O
Gel. Casein. Serum	G. C. S.		
Nitrate reduced	+	O	+
Indol	+	O	O
Milk. Reaction	Acid.	Acid.	Slightly acid.
Coagulation	+	O	O
Odor	Stuffy.	O	Fecal.
Chromogenesis	O	O	O
Fluorescence	+	O	O
Pathogenecis	+	O	+
Remarks	1 c. c. general septicemia. Abd. cav. guinea pig. Isolated 2 times.	Widal reaction 1-50 typhoid blood negative. Isolated 2 times.	1 c. c. g. pig. general septicemia.

TABLE No. 2.—Continued.

Showing Bacterial Species Isolated from the City Water.

Source.	Tap Water.	Tap Water.	Tap Water.
Name	Bacillus lactis aerogenes.	Bacillus proteus.	Bacillus cloacae.
Morphology	Short bacillus.	Long, thin.	Short bacillus.
Gram's Stain	O	O	O
Motile	O	+	+
Spores	O	O	O
Appearance. Agar			
Dull. Wrinkled. Moist	Moist.	Moist.	Moist.
Same. Bouillon	Alkaline.		
Scum. Turbid. Sediment	Turbid.	Turbid.	Turbid, scum.
Same. Potato			
Visible. Gas. Profuse	Profuse.	Profuse.	Profuse.
Aerobic. Anaerobic	Aer. Anaer.	Aer. Anar.	Aer. anaer.
Glucose. Fermentation	85% acid. CO_2-I-H-I.	20% Acid CO_2-I-H-2.	60–100% Acid CO_2-2-H.I.
Lactose. Fermentation	70% acid. CO_2-2-H-I.	O	O-10%.
Saccharose. Fermentation	90% acid. CO_2-2-H-I.	25% Acid CO_2-I-H-2.	60-100% Acid CO_2-2-H.I.
Grows at 37° C.	+	+	+
Liquefaction	O	+	+
Gel. Casein. Serum	+	G. C. S.	G. C. S.
Nitrate reduced		+	X (slight).
Indol	+	+	X (slight).
Milk. Reaction	Acid.	Acid.	Acid.
Coagulation	+	O	O
Odor	O	Fecal.	Fecal.
Chromogenesis	O	O	O
Fluorescence	O	O	O
Pathogensis	O	+	+
Pathogensis		1 c. c. abd. cav. guinea pig.	1 c. c. abd. cav. g. pig.
Pathogensis		General septicemia.	General septicemia.
Remarks		Isolated 10 times.	Isolated 4 times.

TABLE No. 2—Continued.

Source.	Tap Water.	Tap Water.	Tap Water.
Name	B.cloacae (nonliquefaciens.)	Bacillus gasoformans.	B. gasoformans (nonliquefaciens.
Morphology	Short bacillus.	Short bacillus.	Short bacillus.
Gram's Stain	O	+	O
Motile	+	+	+
Spores	O	O	O
Appearance. Agar			
Dull. Wrinkled. Moist	Dull.	Moist.	Moist.
Same. Bouillon			
Scum. Turbid. Sediment	Turbid, scum.	Turbid.	Turbid.
Same. Potato			
Visible. Gas. Profuse	Profuse.	Visible.	Visible.
Aerobic. Anaerobic	Aer. Anaer.	Aer. Anaer.	Aer. Anaer.
Glucose. Fermentation	60-80% Acid. CO_2-2-H-1.	80% Acid. CO_2-2-H-1.	60% Acid. CO_2-I-H-2.
Lactose. Fermentation	O	100% Acid. CO_2-I-H-I.	100% Acid. CO_2-2-H-I.
Saccharose. Fermentation	55-85% Acid. CO_2-2-H-1.	65% Acid. CO_2-I.H-I.	90% Acid. CO_2-2-H-I.
Grows at 37°C.	+	+	+
Liquefaction	O	+	O
Gel. Casein. Serum		Gelatin.	
Nitrate reduced	O (slight.)	O	O
Indol	O (slight.)	O	O
Milk. Reaction	Acid.	Acid.	Acid.
Coagulation	O	O	O
Odor	Fecal.	O	O
	Isolated 2 times.		Isolated 4 times.

TABLE No. 2—Continued.

Source.	Tap Water.	Tap Water.	Top Water.
Name	Bacillus enteriditis.	Bacillus coli communis.	Bacillus Aurescens.
Morphology	Short bacillus.	Short bacillus.	Short bacillus.
Gram's Stain	O	O	
Motile	+	+—O	+
Spores	O	O	O
Appearance. Agar			
Dull. Wrinkled. Moist	Moist.	Moist.	Orange.
Same Bouillon			
Scum. Turbid. Sediment	Turbid.	Turbid.	Turbid.
Same. Potato		Profuse.	Orange.
Visible. Gas. Profuse	Visible.	Aer. Anaer.	Acr.
Aerobic. Anaerobic	Aer. Anaer.	50% Acid.	
Glucose. Fermentation	40% Acid. CO_2-1-H-2.	CO_2-1-H-2.	O
Lactose. Fermentation	O Alkaline	Same.	O
Saccharose. Fermentation	O Alkaline	O or 30% Acid. CO_2-1-H-2.	O
Grows at 37°C	+	+	+
Liquefaction	O	O	+
Gel. Casein. Serum	.....	....	G. C. S.
Nitrate reduced	+	+	+
Indol	O	+	+
Milk reaction	Alkaline.	Acid.	Neutral.
Coagulation	O	+	+
Odor	O	Fecal.	O
Chromogenesis	O	O	Orange.
Fluorescence	O	O	O
Pathogenesis	O	+	O
	Isolated two times.	1 c. c. often caused general septicemia by abd. injection in guinea pigs.	
Remarks	One type was fluorescent.	Isolated 26 times.	

TABLE NO. 2—Continued.

Source.	Tap Water.	Tap Water.	Tap Water.
Name	Bacillus erythrogenes.	Bacillus prodigiosus.	
Morphology	Short bacillus.	Short bacillus.	
Gram's Stain		O	
Motile	O	+	
Spores	O	O	
Appearance. Agar	Lemon yellow.	Red.	
Dull. Wrinkled. Moist			
Same. Bouillon			
Scum. Turbid. Sediment	Scum, turbid.	Scum, turbid.	
Same. Potato			
Visible. Gas. Profuse	Profuse.	Red.	
Aerobic. Anaerobic	Aer.	Aer. Anaer.	
Glucose. Fermentation	O	50% Acid. CO_2-I H-2.	
Lactose. Fermentation	O	Same.	
Saccharose. Fermentation	O	Same.	
Grows at 37°C	O	+	
Liquefaction	+	+	
Gel. Casein. Serum	G. C. S.	G. C. S.	
Nitrate reduced	+	+	
Indol	+	O	
Milk. Reaction	Acid.	Acid.	
Coagulation	+	+	
Odor	O	Pungent.	
Chromogensis	Lemon yellow.	Crimson red.	
Fluorescence	O	O	
Pathogenesis	O	O	
Remarks			

GENERAL SUMMARY.

The first general conclusion which can be drawn from this six years' investigation of the Baltimore water supply only pertains to a small portion of the supply, namely, the wells. The large number of wells containing the colon bacillus, and the greatly increased quantities of the chemical products of decomposition show a general saturation of the sub-soil with the seepage from the cesspits, and proves the need of a general sewerage system.

The results of the bacterial counts and tests for the intestinal bacillus in the streams and rivers show the maximum pollution takes place in the small streams, and the gradual dilution and self-purification in the larger rivers and reservoirs removes a portion of the bacteria from the water before it gets to the city taps. The presence of colon bacilli in the tap water shows that intestinal material is still present, however, and there can be no doubt that a system of filtration would lessen the number of typhoid cases and other water-borne diseases.

Table No. 3, which follows, gives a detailed record of the examination of the water supply for the past six years, and is taken from the previous reports.

TABLE No. 3.

Complete Bacteriological Examinations of Water, 1897.

District, Stream or Well.	Date of Examination.	Colonies per c. c.	Colon Bacillus present.	Condition.
Northwestern District	Jan. 8	193	None in 50 c. c.	
Northwestern District	" 14	231	" "	
Western District.....	" 16	216	" "	
Western District.....	" 20	159	" "	
Central District	Feb. 12	236	" "	
Central District	" 22	305	" "	
Lindsay Stream	" 26	240,000	Present in 0.5 c. c.	Bad.
Dophler Stream	Mar. 1	6,456	None in 0.5 c. c.	Bad.
Shipley Stream.....	" 6	16,950	" "	Bad.
Clinton Jessups Str'm	" 8	2,650	None in 50 c. c.	
Herman Horner Str'm	" 13	17,648	Present in 0.5 c. c.	Bad.
Pot Spring Stream...	" 15	158,000	" "	Bad.
Towson Run.....	" 24	.....	" "	Bad.
Warren Stream.....	" 30	7,421	" "	Bad.
Central District	May 5	409	None in 50 c. c.	
Central District	" 10	240	Present in 50 c. c.	
Well, Roland Park ..	" 17	5,641	*Present in 0.5 c.c.	Bad.
Central District.....	" 17	218	None in 50 c. c.	
Plummer Well.....	" 27	8,640	Present in 0.5 c. c.	Bad.
Central District.....	June 9	630	None in 50 c. c.	
Well, Stansbury	" 24	370	" "	
Central District.....	" 29	45	" "	
Central District.....	July 9	362	" "	
Southeastern District.	" 14	196	" "	
Central District.....	" 19	450	" "	
Well, Chesterwood...	" 24	740	Present in 0.5 c. c.	Bad.
Well, Foley...	" 28	14,400	None found in 0.5 c. c.	
Central District	Aug. 4	237	" " 50 "	
Southeastern District.	" 16	413	" " " "	
Central District.....	" 21	420	" " " "	
Penwood Park.....	" 28	95	" " 0.5 "	
Well, North'n District	Sept. 2	20	" " " "	
Well, Saw Mill.....	" 2	97	" " " "	
Well, Penwood.....	" 2	1,409	" " " "	Bad.
Northern District....	" 15	274	" " 50 "	
Central District.....	Oct. 10	198	" " " "	
Central District.....	" 26	186	" " " "	
Central District.....	" 29	195	" " " "	
Draayer Spring 1	Nov. 4	.....	Present in 0.5 c. c.	Bad.
Draayer Spring 2	" 4	.....	" "	Bad.
Harris Well.....	" 4	.....	" "	Bad.
League Well	" 4	.....	None in 50 c. c.	
Central District.....	" 16	282	" "	
Pump Calverton....	" 24	.....	Present in 5 c. c.	Bad.
Central District.....	" 15	287	None in 50 c. c.	
Well A	Dec. 10	546	Present in 1 c. c.	Bad.

*The bacillus prodigiosus and pyacyaneus were also present in 0.5 c. c.

TABLE No. 3.

Complete Bacteriological Examinations of Water, 1898.

Tap, Stream or Well.	Date of Examination.	Colonies per c. c.	Colon Bacillus. Present.	Condition.
City Tap	Feb. 24	205	None in 50 c. c.	Good.
Stream at Lutherville emptying into City supply	Mar. 7	31,020	Present in 1 c. c.	Bad.
Kennedy stream City supply	" 7	6,347	None in 1 c. c.	"
Lake Roland, surface of lake	" 8	258	None in 5 c. c.	Good.
Lake Roland, 30 feet under surface	" 8	347	" "	"
Phoenix Dam, surface	" 17	234	" "	"
Phoenix Dam, 18 feet below surface	" 17	557	" "	"
Ashland Dam, surface	" 17	1,528	" "	"
Ashland Dam, 15 feet below surface	" 17	660	" "	"
Mouth of Gunpowder River, surface	Apr. 10	24,726	" "	Suspicious.
Mouth of Gunpowder River, 18 feet below surface	" 10	880	" "	Good.
City tap	" 11	280	Present in 50 c. c.	Bad.
Surface, Lake Montibello	May 5	784	None in 1 c. c.	Good.
Lake Montibello, 18 feet below	" 5	1,144	" "	"
Warren Dam, surface	" 13	.....	Present in 50 c. c.	Bad.
Warren Dam, 18 feet below surface	" 13	15,195	" "	"
Great Gunpowder River, below York road bridge, after one week's hard rain	" 13	48,240	Present in 5 c. c.	"
Towson Run, on Swelt's property	" 21	.....	Present in $\frac{1}{2}$ c. c.	"
Towson Run, rear of Consolidated Railroad Co.	" 21	.....	Present in 5 c. c.	"
City Tap	June 1	106	None in 50 c. c.	Good.
Head of Lake Roland	" 8	2,040	" "	"
Lake Roland (Hollins)	" 8	2,730	Present in 5 c. c.	Bad.
Towson Branch Lake Station	" 8	1,551	None in 5 c. c.	Good.
Peterson Run, below Christy property	" 10	1,248	Present in $\frac{1}{2}$ c. c.	Bad.

TABLE No. 3.

Complete Bacteriological Examinations of Water, 1898.

Tap, Stream or Well.	Date of Examination.	Colonies per c. c.	Colon Bacillus Present.	Condition.
East branch of same..	June 10	1,016	Present in ½ c. c.	Bad.
Cromwell Run.....	" 18	1,568	None in 5 c. c.	Good.
Minebank Run, on Treadwell property.	" 18	3,685	" "	Suspicious.
Towson Run, on Longnecker's property...	" 10	6,448	" "	"
Hampden Run, on Ridgely property...	" 10	12,408	" "	"
Towson Run, on Sheppard Asylum property.....	" 18	6,900	Present in ½ c. c.	Bad.
Towson Run, on Mayer property.....	" 18	1,038	None in 5 c. c.	Good.
Southwest Branch of Towson Run, on Sheppard Asylum property.....	" 18	10,368	" "	Bad.
Northwest Branch of Towson Run, on Baldwin property...	" 18	2,976	" "	Fair.
Towson Run, on Enoch Pratt property.....	" 18	2,193	" "	"
Orebank Run..	" 24	.....	" "	"
Ridgely Run.....	" 24	.....	Present in ½ c. c.	Bad.
Sherwood Run, on N. C. R. R. property...	July 1	5,206	None in 5 c. c.	Suspicious.
East Roland Run, on Golbert property ...	" 1	1,320	" "	Good.
Roland Run, on Gurner property.....	" 1	7,860	Present in ½ c. c.	Bad.
Roland Run, below Ruxton.....	" 1	15	None in 5 c. c.	Good.
North Roland Run, on Cockey property....	" 1	2,070	" "	Fair.
Roland Run, on Mrs. M. Gobbert's property.....	" 1	750	Present in ½ c. c.	Bad.
Gurner's Branch of Roland Run.....	" 1	7,409	" "	"
Cockey's Run, at Cockeysville.....	" 16	9,872	" "	"
Beaver Dam Run, at Cockeysville	" 16	3,360	B. Pyocyaneus in ½ c. c.	"
Beaver Dam Run, at Marble Works.....	" 16	25,952	Present in ½ c. c.	"

TABLE No. 3.

Complete Bacteriological Examinations of Water, 1898.

Tap, Stream or Well.	Date of Examination.	Colonies per c. c.	Colon Bacillus Present.	Condition.
Beaver Dam, at Ashland	July 16	18,246	None in 5 c. c.	Bad.
Western Run, at Ashland	" 16	4,064	Present in $\frac{1}{2}$ c. c.	"
Western Run Branch, of Beaver Dam	" 16	9,382	" "	"
Water below Scott Price property	Sept. 8	.....	None in 5 c. c.	Fair.
Water opposite Scott Price property	" 8	.....	Present in 5 c. c.	Bad.
Water above Scott Price property	" 8	.....	" "	"
Water above Yellott house	" 8	.....	None in 5 c. c.	Fair.
Water below Yellott house	" 8	.....	" "	"
Clinton Jessops	Oct. 5	.....	Present in 5 c. c.	Bad.
Yellott house	" 5	.....	" "	"
City Tap	Nov. 21	281	None in 50 c. c.	Good.
" "	Dec. 12	203	" 100 "	"
" "	" 31	128	" 500 "	"

TABLE No. 3—1899.

Tap, Steam or Well.	Laboratory. No.	Date of Examination.	Colonies per c. c.	Colon Bacillus present.	Condition.
Laboratory Tap	270	April 4	186	None in 1-50 c. cs.	Good.
Pump 1, Carroll Park	271	" 4	1,458	" 1 c. c.	Bad.
" 2, "	272	" 4	253	" "	Good.
" 3, "	273	" 4	10,080	Present in 1 c. c.	Very bad.
" in yard of 1116 Winchester street	274	" 22	942	" 5 c. cs.	Bad.
" " 2503 Eutaw Place	275	" 22	32	None in 1 or 7 c. cs.	Good.
" at 2323 Linden avenue	276	" 22	7	" "	Good.
" n.w. cor. Preston st. and Druid Hill av.	277	" 22	Out of use.	Condemned.	.....
" rear of 201 W. Monument street	278	" 25	63	None in 1 c. c.	Good.
" 204 Dolphin street	279	" 25	13	" "	Good.
" at 2852 Pennsylvania avenue	280	" 25	780	" "	Fair.
" 2858 Pennsylvania avenue	281	" 25	444	Present in 1 c. c.	Bad.
" Baker property, Liberty road and Baker street	282	May 10	.....	None in 5 or 50 c. cs.	Good.
" 2600 W. North avenue	283	" 10	Out of use.	Condemned.	.....
" cor. Thomas and North avenue	284	" 10	.....	None in 5 or 50 c. cs.	Good.
" on Second street near North avenue	285	" 10	Out of use.	Condemned.	.....
" 2810 W. Lanvale street	286	" 12	" "	"	.....
" 2826 Lanvale street	287	" 12	600	None in 50 c. cs.	Fair.
" 2847 " "	288	" 12	Out of use.	Condemned.	.....
" 2466 Druid Hill avenue	289	" 12	" "	"	.....
" 2470 " "	290	" 12	" "	"	.....
" H. J. Waters, Liberty rd. and tollgate	291	" 20	708	None in 1 or 50 c. cs.	Good.
" Geo. Long, Liberty road and tollgate	292	" 20	130	" "	Good.
" H. Kinstler, Liberty road, near tollgate	293	" 20	118	" "	Good.
" Jas. Doyle, " "	294	" 20	990	" "	Good.
" P. Donohue, Liberty road, near Slingluff avenue	295	" 20	372	Present in 1 c. c.	Bad.

Pump, C. Keppler, Slingluff avenue, near Liberty road	296	June	5	13,500	Present in 1 c. c.	Bad.
" P. Donohue, Slingluff avenue, near Liberty road	297	"	5	2,070	" "	Bad.
" Mr. Albert, Slingluff avenue near Liberty road	298	"	5	93	" "	Bad.
" H. J. Waters, Slingluff avenue, near Liberty road	299	"	5	324	" "	Bad.
" J. Woods, Slingluff near North avenue	300	"	5	pump dry, out of use		
" G. Long, Slingluff near North avenue.	301	"	5	1,560	Present in 1 c. c.	Bad.
" Windsor avenue and Eleventh street, "Highlands"	302	"	15	100	None in 1 c. c.	Good.
" Chas. Shipley, Liberty road and Beach avenue	303	"	15	29	" "	Good.
" Chas. Shipley, Beach avenue, near Liberty road	304	"	15	213	" "	Good.
" Mrs. Brausnell, Tenth street, near Beach avenue	305	"	15	20	" "	Good.
" Epiphany Cottage, Beach avenue, near Eighth street	306	"	15	84	" "	Good.
" 2517 Pennsylvania avenue	307	"	17	262	" 50 c. c.	Fair.
" 2651 " "	308	"	17	24	" "	Fair.
" 2659 " "	309	"	17	21	" "	Fair.
" cor. Pennsylvania ave. and Clifton st.	310	"	17	11	" "	Fair.
" 1577 Clifton street	311	"	17	100	" "	Fair.
City, at Laboratory tap	312	"	18	145	None in 1-50 c. cs.	Good.
Water from Bull mansion	313	"	20	318	" 1 c. c.	Good.
Pump, Pulaski street, near Liberty road	314	"	30	65	" "	Good.
" Pennsylvania and Fulton avenues	315	"	30	15	" "	Suspicious.
" 201 Bloomingdale avenue	316	"	30	200	" "	Good.
" 761 Bloomingdale road	317	"	30	7,420	" "	Bad.
" Butcher's lane, between Pennsylvania and North avenues	318	"	30	58	" "	Good.
" Mr. Albert, Stingluff avenue, near Liberty road	319	July	6	474	Present in 1 c. c.	Bad.

TABLE No. 3—1899.

Tap, Stream or Well.	Laboratory No.	Date of Examination.	Colonies per c. c.	Colon Bacillus present.	Condition.
Pump, H. J. Walters, Slingluff avenue, near Liberty road	320	July 6	162	Present in 1 c. c.	Bad.
" St Peter's cemetery	321	" 6	190	None in 50 c. cs.	Good.
" Hamilton Easter's estate, Liberty rd.	322	" 6	30	Present in 50 c. cs.	Bad.
" Mr. Ridgely, Liberty road	323	" 6	91	" "	Bad.
" 2858 Pennsylvania avenue	324	" 27	268	" 1 c. c.	Bad.
" 2854 " "	325	" 27	18	None in 1 or 5 c. c.	Good.
" "Elgin," Elgin avenue	326	" 27	1,326	Present in 5 c. c.	Bad.
Spring, "Elgin," Elgin avenue	327	" 27	2,160	None in 1 or 5 c. c.	Bad.
Pump, Mr. Dennis, Elgin avenue	328	" 27	58	" 1 c. c.	Good.
Well, Ridgewood and Grenada avenues, Mr. Reid, Mt. Washington	329	" 27	44	Present in c. c.	Bad.
Spring, Edmondson ave., nr. Potomac R. R.	330	" 27	53	None in 1-50 c. c.	Good.
Pump, Hermitage, Gardiner House	331	August 11	See Chem. Report	.....	.....
Spring, Hermitage, Mansion House	332	" 11	See Chem. Report	.....	.....
" "Evergreen"	333	" 11	See Chem. Report	.....	.....
Pump, Poplar Hill	334	" 11	See Chem. Report	.....	.....
Spring, 2715 W. North ave., H. T. Halstead	335	" 11	30	None in 1 or 50 c. c.	Good.
Thos. Weeks, residence	336	" 11	113	" "	Good.
G. G. Armour, Ridgewood avenue	337	" 11	3	Present in 50 c. c.	Bad.
W. H. Diffenderfer, residence. (Office, U. R. R. Co.)	338	" 11	9,360	None in 1 or 50 c. c.	Bad.
Stand Pipe, West Arlington	339	" 11	4,800	Present in 50 c. c.	Bad.
Hydrant water, 280 W. Baltimore street	340	" 19	See Chem. Report	.....	.....
Stand Pipe, Arlington Tap	341	" 19	3,900	Present in 1 c. c.	Bad.
Western Pump House, into Druid Hill Tap, to stand pipe	342	" 19	165	None in 1-50 c. c.	Good.
High Service, Druid Hill Park	343	" 19	222	None in 1 or 50 c. c.	Good.

Druid Hill Lake, taken from lake	344	August 19	414	Present in 50 c. c.	Bad.
Stand Pipe, bottom	345	" 19	117	None in 1 or 50 c. c.	Good.
Towson Branch, Lake Roland	346	" 19	931	Present in 50 c. c.	Bad.
Jones' Falls, Green Spring Bridge	347	" 19	268	" "	Bad.
Pump house, Lake Roland	348	" 19	1,740	" 1 c. c.	Bad.
Branch from Lakeside, Lake Roland	349	" 19	3,660	None in 1 c. c.	Bad.
Waste from conduit, Gate House, Lake Roland	350	" 19	20,400	Present in 50 c. c.	Bad.
Middle of Lake Roland, 100 yards from the dredge	351	" 19	3,180	None in 1-50 c. c.	Bad.
	352	See Chem. Report			
Cottage avenue, Warfield	353	August 29	114	None in 1 or 50 c. c.	Good.
Pump, 722 York road	354	Sept. 5	2,460	Present in 1 c. c.	Bad.
" 3210 Cedar avenue	355	" 14	34	None in 1 or 50 c. c.	Good.
" 3441 Chestnut avenue	356	" 14	738	None in 1 or 50 c. cs.	
City water, laboratory tap	357	" 25	83	None in 1 c. c.	Good.
Pump, First Toll Gate, Liberty road	358	October 31	396	Present in 50 c. c.	Bad.
" T. J. Brown, Ninth and Pressbury streets	359	" 31	4,320	" "	Bad.
Pump, Mrs. Jas. Carey, Clifton ave. ext.	360	" 81	322	None in 50 c. c.	Good.
" Francis White, North avenue and Twelfth street	361	" 31	288	Present in 50 c. c.	Suspicious.
Hydrant tap, 1223 E. North avenue	362	Nov. 29			
" " Park avenue	363	" 29	See Chem. Report		
Pump, Mr. Fox, Riggs avenue	364	" 29	282	Present in 50 c. cs.	Bad.
" Mr. J. Doyle, Riggs avenue	365	" 29	894	" "	Bad.
" Chas. Hoffman, Riggs avenue	366	" 29	124	None in 50 c. cs.	Good.
" Jas. Cross, Riggs avenue	367	" 29	138	Present in 50 c. cs.	Bad.
" Bruce Hoffman, Riggs avenue	368	" 29	104	See Chem. Report.	
" Wm. E. Turner	369	" 29	82	None in 50 c. cs.	Good.
City water, laboratory tap	370	Dec. 5	796	Present in 50 c. c.	Bad.

TABLE No. 3—1900.

Tap, Steam or Well.	Laboratory No.	Date of Examination.	Colonies per c. c.	Colon Bacillus present.	Condition.
City Water—Southwestern District	371	Jan. 13	246	None in 1 or 50 c.cs.	Good.
Laboratory tap	372	" 10	304	" "	Good.
Southern Police District	373	" 13	336	" "	Good.
Western District	374	" 13	209	None in 1 c. c.	Good.
Central Annex District	375	" 29	159	None in 1 or 50 c.cs.	Good.
Central District, laboratory tap	376	Feb. 1	222	Present in 50 c. cs.	Bad.
Eastern District	377	" 1	378	Present in 1 c. c.	Bad.
Northeastern District	378	" 1	335	None in 1 or 50 c.cs.	Good.
Northwestern District	379	" 1	439	Suspicious in 50 c.cs.	Suspicious.
Southwestern District	380	" 6	1,908	None in 1 or 50 c.cs.	Suspicious, as bacteria are rather high.
Pumps—2508 Mosher street entended	381	Mar. 12	618	None in 1 or 5 c. cs.	Fair.
2516-18 Mosher street extended	382	" 12	954	Present in 5 c. cs.	Bad.
2534 Mosher street extended	383	" 12	828	None in 1 or 5 c. cs.	Suspicious.
Mrs. Ray, Riggs avenue extended	384	" 12	366	" "	Good.
Mrs. Flanagan, Riggs avenue extended	385	" 12	444	" "	Good.
1007 Second street, Northwest Annex	386	" 12	822	" "	Fair.
2402 Riggs avenue	388	" 31	.....	Present in 50 c. cs.	Bad.
2542 Mosher street extended	389	" 31	notover300	None in 1 or 50 c.cs.	Good.

Mrs. L. B. Pernell, Third street extended	390	Mar.	31	.....	Present in 50 c. cs.	Bad.
5 Third avenue extended	391	"	31	.....	Present in 1 c. c.	Bad.
13 Third avenue extended	392	"	31	.....	.....	Cannot classify.
1104 Third avenue extended	393	"	31	.....	.....	Cannot classify.
2800 Lafayette avenue	394	"	31	134	Present in 50 c. cs.	Bad.
1022 Bloomingdale road	395	"	31	510	Suspicious in 50 c. cs.	Suspicious.
Mrs. L. B. Purnell, Bloomingdale road	396	"	31	315	.....	Fair.
Q. L. Berry, Bloomingdale road	397	"	31	510	None in 1 or 50 c. cs.	Fair.
S. L. Brayshaw, Franklin road	398	April	25	125	" "	Good.
Wm. Williamson, Franklin road	399	"	25	40	" "	Good.
E. B. Tyler, Franklin road	400	"	25	726	" "	Fair.
H. Gerkins, Franklin road	401	"	25	4,680	" "	Bad.
James Cross, Riggs avenue extended	402	"	27	11,520	Present in 1 c. c.	Very bad.
2508 Mosher street	403	"	27	224	None in 1 or 50 c. cs.	Good.
2534 Mosher street	404	"	27	3,060	Present in 1 c. c.	Bad.
C. Flanigan, Riggs avenue extended	405	"	27	239	.....	Good.
2542 Mosher street	406	"	27	732	None in 1 or 50 c. cs.	Suspicious.
Ninth and Pressbury streets	407	May	7	5,760	" "	Bad.
1022 Bloomingdale road	408	"	7	643	" "	Fair.
Mrs. J. Carey, Clifton avenue extended	409	"	7	7,620	Present in 50 c. cs.	Bad.
Francis White, North avenue extended	410	"	7	135	" "	Bad.
John Nixon, Franklin Valley Farm, Franklin road	411	"	18	1,050	None in 1 or 50 c.cs.	Bad.
849 Franklin road	412	"	18	300	" "	Fair.
James Busby, Franklin road	413	"	18	570	" "	Fair.
Mrs. Jane McCormick, Franklin road	414	"	18	600	" "	Fair.
812 Franklin road	415	"	18	180	.....	Bad.
Mrs. Purnell	416	"	—	732	None in 1 or 5 c. cs.	Suspicious.
G. W. Sharretts, Easter lane	417	June	5	606	Present in 50 c. cs.	Bad.
John Lutz, Easter lane	418	"	5	288	" "	Bad.
Wm. Workinger, Liberty road	419	"	5	126	None in 1 or 50 c. cs.	Suspicious.
Edwin Quick, Liberty road	420	"	5	2,700	" "	Bad.
Pumps—Mitchell, Liberty road	421	"	5	22	None in 1 or 50 c.cs.	Good.
2800 block, Lafayette avenue	422	"	5	52	Present in 50 c. cs.	Bad.
Well—Quarantine	423	"	19	274	None in 1 or 50 c. cs.	Good.

TABLE No. 3—1900.

Tap, Stream or Well.	Laboratory No.	Date of Examination.	Colonies per c. c.	Colon Bacillus present.	Condition.
Spring—Quarantine	424	June 19	37	None in 1 or 50 c.cs.	Good.
Pump—Harry Hartman, Eastern lane	425	" 19	216	" "	Good.
A. Abraham, Eastern lane	426	" 19	288	" "	Good.
City Water—Laboratory tap	427	" 13	284	Present in 1 c. c.	Bad.
Laboratory tap	428	" 19	282	None in 1 c. c.	Fair.
Pump No. 1—Mrs. Purnell	429	" 22	120	None in 1 or 50 c.cs.	Good.
No. 2—Mrs. Purnell	430	" 22	96	Present in 50 c. cs.	Bad.
City Water—Laboratory tap	431	July 5	326	None in 1 or 50 c.cs.	Bad.
Well—John Veise, Reisterstown	432	" 16	900	Present in 1 c. c.	Bad.
Pump—Brent Reed, Reisterstown road	433	" 16	690	None in 1 or 50 c.cs.	Good.
John Schaefer, Reisterstown road	434	" 16	48	None in 1 c. c.	Good.
Philip Fix, Reisterstown road	435	" 16	83	Present in 1 c. c.	Bad.
Rachel Disney, Reisterstown road	436	" 16	1,440	None in 1 c. c.	Suspicious.
James Carey, Clifton avenue	437	" 19	84	None in 1 or 50 c.cs.	Good.
Pennhurst and Edward aves. W. Arlington	438	" 19	774	" "	Good.
2852 Pennsylvania avenue	439	" 28	216	None in 1 c. c.	Good.
M. Murphy, Irvington	440	" 21	1,470	" "	Bad.
H. Odenwall, Irvington	441	" 21	1,041	" "	Bad.
Spring—Huper's, Irvington	443	" 21	8,100	.....	Bad.
Artesian Well—13 South Frederick street	444	" 24	65	None in 1 c. c.....	Suspicious.
Well—J. E. Tippett, Garrison	446	" 24	294	Present in 1 c. c....	Bad.
City Water—Laboratory tap	447	Aug. —	831	" "	Bad.
Pump—H. Phillip, Hillen road, No. 1	448	" —	1,560	None in 1 c. c.....	Suspicious.

Pump—H. Phillip, Hillen road, No. 2	449	Aug.	—	1,740	None in 1 c. c.	Suspicious.
Mrs. Rainey, 121 Brady avenue	450	"	—	2,560	Present in 1 c. c.	Bad.
J. B. Yeagle, North Walbrook	451	"	—	804	" "	Bad.
Gwynn Oak House, Gwynn Oak	452	Sept.	10	1,620	Present in 1 or 50 c.cs.	Bad.
City Water—Laboratory tap	453	"	10	150	None in 1 c. c.	Good.
Pump—(House) H. T. Campbell, Harford road	454	"	10	260	" "	Good.
(Stable) H. T. Campbell, Harford road	455	"	10	134	" "	Good.
Well—Quarantine, No. 1	456	Oct.	12	16	Present in 50 c. c.	Suspicious.
Quarantine, No. 2	457	"	12	128	None in 1 or 50 c. cs.	Good.
City Water—Laboratory tap	458	"	3	390	Present in 1 or 50 c.cs.	Bad.
Pump—E. C. Bosworth, Hoffman lane, Carroll Sta.	459	Nov.	17	3,510	Present in 1 c. c	Bad.

TABLE No. 3.—1901.

Tap, Stream or Well.	Date.	Colonies Per c.c.		Colon Bacillus.	Condition.
		Aerobic.	Anaerobic.		
Pump—Richard Beeler, Shirley lane and Reisterstown road	April 6	1,170	.....	Present in 50 c. c.	Bad.
Wm. Breckenridge, Shirley lane	" 6	573	.....	Present in 1 and 50 c. c.	Bad.
G. W. Gail, Pimlico road	" 6	870	.....	Present in 50 c. c.	Bad.
Daniel H. Whitney, Shirley lane	" 6	6,900	.....	Not present in 1 and 50 c.c.	Bad. Too many bacteria.
Wm. Ludwig, Shirley lane	" 6	594	.....	" " "	Fair.
E. C. Bosworth, Hoffman lane	" 12	1,440	.....	Present in 50 c. c.	Bad.
Well—Quarantine	May 5	26,700	.....	Not present in 1 and 50 c.c.	Bad.
Pump—J. S. Spence, 1022 Bloomingdale road.	" 25	6,300	.....	Present in 1 and 50 c. c.	Very bad.
City Water—Laboratory tap	June 18	2,724	Not estimated	Not present.	Bad.
Pump—Mr. Yearley	" 16	Not estimated	.....	Not present in 1 c. c.	.....
City Water—Laboratory tap	" 8	188	26	.....	.....
Pump—Lydecker's	July 11	18	.....	Not present in 1 and 50 c.c.	Good.
Dietrick's	" 11	7	.....	" " "	Good.
Owens Distillery	" 11	217	.....	" " "	Good.
Catonsville Water—Dr. Hahn, Irvington	" 11	238	.....	Present in 1 and 50 c. c.	Bad.
Pump—Leary Miller's	" 11	930	.....	Present in 1 c. c.	Bad.
Dr. Hollyday, Frederick avenue	" 11	84	.....	Not present in 1 and 50 c.c.	Good.
Front of 1422 Block street	" 29	45	.....	" " "	.....
Front of 1518 Thames street	" 29	248	.....	" " "	.....

City Water—First ward	Sept.	3	2,820	122	Present in 50 c. c.	Bad.
Second ward	"	3	164	62	Not present in 1 and 50 c.c.	Suspicious.
Third ward	"	3	160	168	" " "	Suspicious.
Fourth ward	"	3	678	210	" " "	Good.
Fifth ward	"	3	243	198	" " "	Suspicious.
Sixth ward	"	3	78	83	" " "	Suspicious.
Seventh ward	"	24	336	68	Present in 1 c. c.	Bad.
Eighth ward	"	24	348	53	Present in 1 and 50 c. c.	Bad.
Ninth ward	"	24	252	29	Present in 50 c. c.	Bad.
Tenth ward	"	24	426	36	" "	Bad.
Eleventh ward	"	24	228	28	Present in 1 c. c.	Bad.
Twelfth ward	"	24	204	74	Present in 1 and 50 c. c.	Bad.
Fourteenth ward	Oct.	22	57	63	Not present in 1 and 50 c.c.	Good.
Sixteenth ward	"	22	69	29	" " "	Good.
Eighteenth ward	"	22	93	95	" " "	Good.
Nineteenth ward	"	22	104	85	Present in 50 c. c.	Bad.
Stream—Light street bridge (at foot of bridge).	Dec.	13	.....	.....	Not present in 1 and 50 c.c.	.....
Light street bridge (at foot of bridge).	"	13	.....	.....	Present in 50 c. c.	Bad.
Fort McHenry (at water front)	"	13	.....	.....	Present in 1 and 50 c. c.	Bad.
Fort McHenry (60 ft. from water front)	"	13	.....	.....	Present 50 c. c.	Bad.
Public baths (at water front)	"	13	.....	.....	Not present in 1 and 50 c.c.	.....
Public baths (60 ft. from water front)	"	13	.....	.....	Present in 1 and 50 c. c.	Bad.

EXAMINATION OF SEWAGE.

Many examinations of the stream called Jones' Falls, containing a large portion of the city sewage, have been made. This stream runs through the centre of the city and empties into the basin. The colon bacillus is always present, and the bacteria vary from 500,000 to 1,000,000 per cubic centimeter (15 drops.)

REPORT ON THE BACTERIOLOGICAL EXAMINATION OF MILK DURING THE YEAR 1902.

The following report is based upon a series of examinations made by Mr. E. H. Schorer, under the supervision of the City Chemist and Bacteriologist.

Examination of the Milk as Received at the Various Railroad Stations.

The first series of examinations was made from the milk as it is received in the cans at Fulton station of the Western Maryland Railroad Company.

Eight samples were examined with the following averages:

Lactometer reading, 102; specific gravity, 1.0305; fat, 6.6 per cent.; acidity, 2.3 per cent.; formaldehyde, 1 in 8 samples; bacterial count, 1 per cent., acid agar, 2,288,700; Neutral agar, 2,175,200.

The next series of examinations were made from the Maryland and Pennsylvania R. R. Station, 10 samples were examined: Lactometer reading, 102; specific gravity, 1.0305; fat, 5.32 per cent.; acidity, 2,131; formaldehyde, 3 in 10; bacterial count, 1 per cent.; acid agar, 1,441,600; neutral agar, 1,181,800.

The next set of samples were taken from Calvert Station of the Pennsylvania R. R.; 10 samples examined. Lactometer reading, 102; specific gravity, 1.0302; fat, 5.47 per cent.; acidity, 1.99; formaldehyde, 3 in 10; bacterial count, 1 per cent.; acid agar, 1,688,700; neutral agar, 1,686,700.

Hillen Station of the Western Maryland R. R., 11 samples examined: Lactometer reading, 102; specific gravity, 1.0305; fat., 5.88 per cent.; acidity, 2.22; formaldehyde, 1 in 11; bacterial count, 1 per cent.; acid agar, 1,390,550; neutral agar., 1,294,220.

President Street Station of the Pennsylvania R. R., 10 samples examined: Lactometer reading, 101.6; specific gravity, 1.0300; fat, 6.93 per cent.; acidity 2.0; formaldehyde, 0 in 10 samples; bacterial count acid agar., 2,246,000; neutral agar., 2,881,230.

Camden Station of the Baltimore and Ohio R. R., 11 samples examined: Lactometer reading, 101.3; specific gravity, 1.0298; fat, 5.46 per cent.; acidity, 2.15; formaldehyde, 2 in 11; bacterial count, acid agar., 1,504,200; neutral agar, 1,128,800.

In all, 60 samples were examined, and the total results were as follows: Lactometer reading, 102; specific gravity, 1,0306; fat, 5.82 per cent.; acidity, 2.05; formaldehyde, 9 in 60; bacterial count, acid agar, 1,767,916; neutral agar, 1,711,293.

Examination of the Wagons on the Streets of the City.

Another series of examinations were made of the milk obtained from the wagons serving milk to the various districts, and many of these samples were of milk obtained at the stations on the previous afternoon.

Northwestern district, 10 samples examined: Lactometer reading, 101; specific gravity, 1.0300; fat, 3.98 per cent.; acidity, 2.24; formaldehyde, 5 in 10; Milk of day before, 6 in 10; bacteria acid agar, 1,288,400; neutral, 937,333.

Northwestern district, 11 samples: Lactometer reading, 100.8; specific gravity, 1.0296; fat, 4.21 per cent.; acidity, 2.45; formalhyde, 6 in 11; milk of day before, 10 in 11; bacteria, acid agar, 4,067,633; neutral agar, 1,360,000.

Northeastern district, 10 samples; lactometer reading, 100.8; specific gravity, 1.0298; fat, 3.94 per cent.; acidity, 2.8; milk of the day before, 9 in 10; formaldehyde, 7 in 10; bacteria, acid agar, 5,070,600; neutral agar., ——.

Northeastern district, 7 samples; lactometer reading, 103; specific gravity, 1.0310; fat, 4.4 per cent.; acidity, 2.4; formaldehyde, 5 in 7; milk of day before, 6 in 7; bacteria, acid agar 5,353,333.

Southeastern district, 11 samples; lactometer reading, 100.2; specific gravity, 1.0295; fat, 3.74 per cent.; acidity, 2.1; formaldehyde, 5 in 11; milk of day before, 9 in 11; bacteria, acid agar 4,924,200.

Grand total of milk from wagons, 49 samples; lactometer reading, 101; specific gravity, 1.0300; fat, 4.12 per cent.; acidity, 2.27; formaldehyde, 28 in 49; milk of day before, 40 in 49; bacteria, acid agar, 4,038,191; neutral agar, (10 samples, 979,900).

SUMMARY OF AVERAGES OF CITY INSPECTIONS.

	Stations.	Wagons.	Stores.	Condemned Milk.
Specific gravity.....	1.0305	1.0300	1.0290	1.0268
Lactometer	102	101	100	97.8
Fat	5.82%	4.12%	3.5%	3.23
Acidity.....	2.05	2.27	2.29	1.5
Formaldehyde.....	15%	57.1%	50%	43%
Acid agar. (bacterial) .	1,767,916	4,083,191	3,000,500	8,755,000
Neutral agar.....	1,711,293	.....	5,161,600	7,052,375

The Examination of Milk in Small Stores.

Eight samples of milk were examined from stores in the vicinity of Hillen Station. The following was the result:

Lactometer reading, 100.1; specific gravity, 1.0295; fat, 4.64 per cent.; acidity, 2.28; formaldehyde, 4 in 8 samples; bacterial count, neutral agar, 5,161,600.

Sixty samples from stores throughout the city were examined at a later period, with the following results:

Lactometer reading, 100; specific gravity, 1,029; fat, 3.5 per cent.; acidity, 2.29; formaldehyde, 13 in 30; bacterial count, acid agar, 3,000,500; neutral agar, 4,876,134.

In all of these examinations the lactometer readings were made from the New York Board of Health Lactometer used by the inspectors of the department. The specific gravity is determined from the lactometer reading at a temperature of 60°. The fat was determined by the modified Babcock method, and the acidity is given in c.c.s. of normal sodium hydroxide solution neutralizing 100 c.c.s. of milk. The agar was neutral or 1 per cent. acid, and the formaldehyde tests were made by Helmer's sulphuric acid test.

Summary of the Bacteriological Examination of the Milk Supply for the past Six Years.

The bacteriological examination of the milk supply of the city was begun January 1, 1897, and has continued until the present time.

The first series of examinations was made by Dr. Arthur Wegefarth and myself, to find out how many cows in a given number supplying milk to the city were affected with inflammatory disease of the udder. This can be detected by examining the milk and the strippings from individual cows, and if the pus cells are above 20 to the field of the immersion lens, after centrifugalizing 10 cubic centimeters, and spreading the sediment on a slide, the cow is considered unfit for furnishing milk to the community.

This condition is called garget, and the conclusions arrived at in the investigation show how a microscopic examination of the milk from individual cows will exclude animals from the herd who will otherwise introduce pus-cells and streptococci into the mixed milk used for human consumption. During 1901 a large number of cows within the city limits were examined by this method, and a number were found suffering from garget. These animals were condemned by the department, and the milk was not used in the trade. The passage of an ordinance compelling the use of pasturage for cows kept within the city limits has greatly lessened the number of diseased cows supplying milk to the public. During 1900, Miss E. M. White made a large number of examinations of the city milk for pus-cells and also estimated the bacteria present in many samples of milk. Her article, found in the report for 1900, doubtless had influence in securing the legislation mentioned above.

The results and conclusions concerning the presence of pus in milk were as follows:

Examination of Milk from individual Cows for Pus-cells.

No. 1 consists of 100 cows in the country, kept in a well-ventilated stable, with good roomy stalls and good pasturage. They are fed while in the stable on bran, ground corn and hay. The cows are curried and cleansed daily. The herds are inspected by competent veterinary surgeons, and all sick animals are isolated. The usual precautions regarding cleanly milking are observed.

No. 2 consists of 50 cows in the country having badly ventilated stables, narrow stalls and bad pasturage. They are fed on distillery grains, cut hay and bran, the precautions mentioned above as regards inspection and cleanly milking are not observed.

No. 3 consists of 100 cows kept in the city, always confined to stables, with narrow stalls, no ventilation, light or pasturage. They are fed on brewery grain, distillery slops,

bran and hay. The cows, as a rule, never leave the stable until they go dry or are taken out to be exchanged. The milk was furnished by the city veterinarian, Dr. George C. Cornelius, who was careful to select different sections of the city, and who personally superintended the drawing of the milk.

The results follow: Examinations by 1–12 inch oil immersion lens.

The above tables show that grade No. 1 gives a general average of 1.1 pus cells to the field.

No. 2 gives an average of 11.3, while No. 3 shows 19.2. In herd No. 1, practically no pus organism, such as streptococci or staphylococci were found. Herd No. 3 showed streptococci present in large numbers; by cover slip in eight instances. The regular nucleus of the epithelial cell enabled us to exclude these bodies in our counts.

The milks mixed from the various herds of grade No. 3 showed streptococci, bacteria and pus.

The highest number of the pus cells in any one cow was 158.5 to the field. The lowest in grade No. 3 was 1, and there were only 5 which gave this percentage, while in grade No. 1 there were 45.

Seventy-five cows gave an average in grade No. 1 of less than 1 cell to the field, while in grade No. 3, out of 100 cows, there were 12.

Ninety-three cows out of 100 in grade No. 1 gave less than 5 cells to the field, while in grade No. 3, 38 gave this average.

Ninety-eight cows in grade No. 1 out of 100, gave less than 10 cells to the field; in No. 3 grade, 54 out of 100 showed this number.

Conclusions.

Garget, or inflammation of the udder or teats, is a not infrequent condition among the many herds supplying milk to various cities or communities.

Milk from individual animals often contain many pus cells, and the accompanying organisms of suppuration.

The study of the epidemic just described, as well as the important work of Booker and others, certainly strongly suggests that such milk is capable of causing the various forms of gastro-enteritis, especially in children and infants.

The microscopic examination of the centrifugalized sediment of the milk from a herd of cattle if found to contain an excessive amount of pus, should suggest a careful inspection of the herd.

General Summary concerning the Bacteriological Examination of the Milk Supply.

The microscopic examination of the milk from each cow of a herd has shown that certain cows suffer from inflammation of the udder, and that these cows introduce the germs of inflammation into mixed milk used for human food.

The table of the summary of city inspections shows a fair condition of the milk from a bacteriological standpoint when received at the stations, but this condition is not as good in the milk taken from stores, wagons, and condemned samples. It is an interesting point that the acidity increases as the bacterial count increases, and the use of acidity tablets for determining the acidity might give a general idea of the variation in the bacterial count during the various seasons. The presence of formaldehyde does not seem to have caused the diminution of bacteria in many samples.

Park, the Assistant Bacteriologist to the New York Department of Health, has made a large number of examinations of the New York milk supply, and in many of the samples he found that the bacteria were present in enormous numbers, at times running from 10 to even 100 million to the cubic centimeter under certain conditions. He thinks that it is possible for a municipality to maintain a certain standard to which milk should conform, and he recommends 500,000 as the standard per cubic centimeter for milk at the

stations, and 1,000,000 per c.c. for milk in general distribution. Our examinations show that some of the milk both at the stations and during delivery and while awaiting sale does not conform to this standard for bacterial purity.

BACTERIOLOGICAL AND CHEMICAL EXAMINATION OF THE ICE-CREAM SUPPLY.

During the past summer Miss Henrietta M. Thomas, of the Woman's Medical College, made a number of analyses of samples of ice cream and hokey-pokey.

Her paper in detail is published in the January number of the Maryland Medical Journal, and as this work was done under the direction of the department a summary is given of the results.

Dr. J. König found from 8.17 per cent. to 70.10 per cent. of fat in fresh cream in Germany. In the samples of ice cream examined the per cent. of fat was never higher than 11.2, and in one instance it was as low as 1.25. Of course, we must remember that flavorings, sugar, eggs, etc., are added to the fresh cream, so that we cannot expect to find as great an amount of fat in ice cream as we do in ordinary cream. Still, when the per cent. is as low as 3, or even 4, we may feel reasonably sure that that so-called ice cream came more from the bottom than the top of the pail.

Turning now to the bacteria found in ice cream, we will first consider the number present in 1 c. c. This varied from 378,000 to 36,600,000. In some very interesting investigations made by Drs. H. W. Conn and W. M. Esten[2] they found that in sweet cream collected for ripening the number of bacteria ranged from a figure too small to be ascertained in the dilution used to 36,000,000. From this it would seem that the number of bacteria in ice cream is practically the same as that in fresh cream. That this is

the case is rather remarkable when we consider the unsterilized substances which have been added, and that the mixture has been put into unsterilized cans. It may, however, be partly accounted for by the fact, according to experiments made by Dr. Prudden,[3] that there are varieties of bacteria which are reduced by freezing.

Bacterial Species found.

A few saprophytic bacteria and chromogenic bacteria were isolated, and the colon bacillus, the normal inhabitant of the intestine, was also frequently found. An organism resembling the pneumococcus, and several streptococci were also detected.

Her conclusions and tabulated results follow, and it may be stated that Dr. Henry Lee Smith made the original suggestions concerning her investigations. The counts were made from dilutions of 1–2000 in sterile water.

Conclusions.

First—That cheap ice cream is extremely poor in fat, and that even in specimens from good confectioners the per cent. is not high.

Second—That the number of bacteria in ice cream is not materially higher than that found in fresh cream, though it is slightly higher.

Third—That the kinds of bacteria found in some of my specimens indicate either that the cows from which the milk was obtained were infected, or that the handling of the ice cream was very careless, thus rendering it unsuitable for food. Both of these causes of contamination can and ought to be obviated. Thoroughly clean handling of ice cream is of as great importance as is that of milk, and the sooner doctors insist that ice cream given to their patients be only from entirely trustworthy sources the sooner will this care be given.

In conclusion, I would refer to the accompanying tables, which give further details of the work:

	Per Cent. Fat.	Aerobic Bacteria in 1 c. c.	Media used.	Anaerobic Bacteria in 1 c. c.	Bacterial Species.
	.....	378,000	Gelatine.	.....	Colon.
Hokey-Pokey	3.4	664,000	Hiss'.	1,656,000	.....
	2.	684,000	Hiss'.	840,000	.....
	1.25	1,000,000	Gelatine.	.....	.....
	1.4	9,204,000	Hiss'.	.....	.....
	1.6	6,840,000	Hiss'.	5,664,000	Bacillus Annulatus.
	2.	660,000	Gelatine.	.....	.....
	2.	5,000,000	Agar.	1,872,000	.....
	2.8	1,500,000	Gelatine.	444,000	.....
	3.4	11,112,000	Hiss'.	1,000,000	.....
	3.6	36,600,000	Agar.	.....	Colon, Pneumococcus.
	3.8	2,670,000	Gelatine.	.....	.....
	4.5	5,067,000	Agar.	.....	Coccus.
	5.	15,000,000	Agar.	3,324,000	Pneumococcus.
Ice-Cream	5.4	17,500,000	Hiss'.	.....	.....
	6.	6,260,000	Agar.	2,230,000	.....
	8.	5,718,000	Agar.	.....	Bacillus Arborescens.
	8.	7,200,000	Agar.	2,000,000	Colon.
	8.	8,280,000	Agar.	2,400,000	Pneumococcus?
	8.	6,720,000	Agar.	.....	.....
	8.8	1,110,000	Hiss'.	3,000,000	Yeast.
	9.4	2,030,000	Gelatine.	91,000	.....
	11.2	3,160,000	Agar.	.....	Lemon Yellow Tetrad.
	.....	4,250,000	Agar.	234,000	Cream-colored Tetrad.
	.....	1,776,000	Agar	212,000	The Gas Bacillus, Streptococcus and Yel-
	.....	3,155,000	Hiss'.	362,000	Yeast. [low Tetrad.
Snowball	.....	1,404,000	Hiss'.	.....	Colon.
	.....	400,000	Hiss'.	.....	Colon.
	.....	250,000	Hiss'.	.....	Colon.

EXAMINATION OF SPECIMENS OF DISEASE FOR PHYSICIANS.

Table No. 4 will show the work performed in the laboratory for the physicians of the city. In 1900, 2,202 specimens for diphtheria were examined; in 1901 we examined 1,884, and in the past year only 1,749 came to the laboratory. This is probably due to the general decrease in this disease.

In 1900, the Throat inspector made 4,200 cultures from children in infected houses, and in 1901 he made 2,712. During the last year he only made 1,905 cultures, but this again is due to the smaller number of infected houses. 97 throats contained the germs of diphtheria, and if these children had mixed with the public the disease would have been spread to healthy children and even adults. Only 42 cultures were taken from the throats of school children, and diphtheria might be even more reduced if a general inspection of schools were possible with the present force. 3 were found positive in the school room, and removed until well.

845 examinations were made for tuberculosis, and 262 were positive.

Table No. 5, which follows Table No. 4, shows the total amount of tests made for physicians during the past seven years. Nearly 50,000 specimens have been sent by physicians during this time.

TABLE No. 4.

Examinations of Specimens to Determine the Presence of Disease.

Diphtheria, positive cultures	417
" negative "	1,288
" suspicious cultures	31
" unsatisfactory cultures	13
Diphtheria, total cultures	1,749
Diphtheria, positive cultures of school children's throats	3
" negative " " " "	39
" suspicious " " " "	.....
Diphtheria, total cultures of school children's throats	42
Diphtheria, positive cultures examined by throat inspector	97
" negative " " " "	1,808
Diphtheria, total cultures examined by throat inspector	1,905
Tuberculosis, positive results	262
" negative results	581
" suspicious	1
" unsatisfactory results	1
Tuberculosis, total results	845
Typhoid fever, positive reactions	493
" negative reactions	739
" suspicious reactions	103
" unsatisfactory reactions	12
Typhoid fever, total reactions	1,347
Malaria, positive results	3
" negative results	195
" unsatisfactory results	2
Malaria, total results	200
Antitoxin, units supplied in indigent cases	1,625,000
" cases treated by Health Department	909
Vaccine virus, tubes supplied by Health Department	56,030
Water, complete examinations made	48
Examinations, miscellaneous	67

TABLE No. 5.

Showing the total number of Examinations for Physicians during the past seven years.

Examinations for diphtheria	13,081
" of school children	5,816
" for tuberculosis	6,265
" " typhoid fever	4,554
" " malaria	311
" of miscellaneous specimens	172
" made by throat inspector	14,218
Total	44,417

THE USE OF ANTITOXIN IN THE TREATMENT OF DIPHTHERIA.

During the past year the department has furnished antitoxin for the treatment of 399 cases of diphtheria. There were 43 deaths, making a fatality rate of 10.7 per cent. This is a slight increase over last year, when the fatality was only 8.45 per cent. The department uses 2,000 units repeated every 12 hours until improvement takes place. In severe cases an initial dose of 3,000 units is often used.

In 160 cases the diphtheria bacillus was found and the number of deaths was only 11, or a fatality of 6.87 per cent. This is a very good record in verified cases, and it is unfortunate that many physicians will use the department antitoxin, and will not send in cultures. These are issued with the antitoxin, and should always be returned in order to arrive at correct conclusions. Many physicians will not do this, and we can not refuse to issue the antitoxin, since it might decrease the chance of the patient's recovery. The fatality in laryngeal diphtheria was only 16 per cent. Before the use of antitoxin these cases were usually fatal.

Striking results have been accomplished in preventing the spread of diphtheria. 251 children exposed to diphtheria in infected houses were immunized by the use of 1000 units of antitoxin, and not a child developed diphtheria. If these children had been protected by antitoxin many of them would have developed the disease.

Table No. 6, which gives the tabulated results also shows the importance of injecting the antitoxin in the early stages of the disease. When treated in the first 24 hours, the fatality is only 4.68 per cent., and 8.8 per cent. in the first 48 hours. It gradually increases after this time. The surprising number of 13 cases of cardiac paralysis shows the importance of keeping cases of diphtheria very quiet until all danger of cardiac exhaustion from the damaged heart muscle has passed.

Table No. 7 gives the results of antitoxin since 1898, and contains some very encouraging figures. In 2,196 cases considered diphtheria by the physicians only 218 died when treated with antitoxin, giving a fatality of 9.9 per cent. In 1,204 cases the diphtheria bacillus was found, and only 100 died, a fatality of 8.3 per cent. It is unfortunate that in 994 cases no cultures were taken as the statistics are not as accurate on this account. The comparatively small fatality in laryngeal cases and the increasing death rate as the injection of antitoxin is delayed is also shown in the table.

1,151 children in infected houses were immunized with 1,000 units each of antitoxin, and only six developed diphtheria. Several of these only received 500 units, and this dose is not always protective.

When the above figures are compared with the previous fatality of 55 per cent. in Baltimore before the use of antitoxin, and to Welch's figures of 42.1 per cent. the practical results in the saving of human life are to say the least gratifying. Not only have many lives been saved, but the persistent decrease in the cases of diphtheria treated and reported shows that the spread of the disease has been limited, partially by this work.

TABLE No. 6.

Cases of Diphtheria Treated with Antitoxin Furnished by the Health Department from January 1, 1902, to December 31, 1902.

Cases.	Deaths.	Mortality.	Extent of Membrane.				Complications.					Cases Immunized.		
			Tonsils.	Tonsils and Pharynx.	Nasal.	Larynx.	Broncho-Pneumonia.	Nephritis.	Sepsis.	Paralysis.	Cardiac Paralysis.	Total.	Successful.	Diptheria Developed.
399	44	10.7	254	84	20	80	3	1	2	10	13	251	251	0

Cases in which diphtheria bacilli were found..... 160
Deaths resulting 11
Percentage of mortality..... 6.87

Cases of laryngeal diphtheria..... 80
Deaths resulting..... 16
Percentage of mortality..... 20

Mortality After Use of Antitoxin According to Duration of Disease at Time of Injection.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day	Eighth day.	Tenth day.	Unknown.
Cases	128	125	80	38	15	1	6	3	1	.....
Deaths	6	11	6	3	2	0	1	0	1	.....
Percentage	4.68	8.8	7.5	7.8	13.3	.....	16.6	.....	100	.....

Mortality in cases not treated with antitoxin (Welch)..... 42.1 per cent.
Average mortality in Baltimore for four years (1894, 1895, 1896, 1897) prior to the use of antitoxin.. 55.18 per cent.

TABLE No. 7.

Cases of Diphtheria Treated with Antitoxin Furnished by the Health Department from January 1, 1898, to December 31, 1902.

Cases.	Deaths.	Mortality.	Extent of Membrane.				Complications.					Cases Immunized.		
			Tonsils.	Tonsils and Pharynx.	Nasal.	Larynx.	Broncho-Pneumonia	Nephritis.	Sepsis.	Paralysis.	Cardiac Paralysis.	Total.	Successful.	Diphtheria developed.
												3 yrs.	3 yrs.	
2196	218	9.9	1028	667	184	347	21	27	25	45	54	1151	1145	6

Cases in which diphtheria bacilli were found	1204	Cases of laryngeal diphtheria	347
Deaths resulting	100	Deaths resulting	100
Percentage of mortality	8.3	Percentage of mortality	28.8

Mortality after use of Antitoxin, according to duration of disease at time of injection.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day	Eighth day.	Tenth day.	Unknown.
Cases	611	692	354	143	67	19	42	9	11	13
Deaths	30	50	35	22	14	7	10	3	6	3
Percentage	4.9	7.22	9.88	15.3	20.8	36.8	23.7	33.3	54.5	23

Mortality in cases not treated with antitoxin (Welch) ..... 42.1 per cent.
Average mortality in Baltimore for four years (1894, 1895, 1896, 1897) prior to the use of antitoxin. 55.18 per cent.

DIVISION OF THROAT INSPECTION AND DISINFECTION.

The report of the Throat Inspector, Dr. Alan W. Smith, which follows this report, shows 792 houses visited. This work is of the utmost importance, as 97 children were found with diphtheria bacilli in their throats. Thirty-six of these showed no clinical symptoms of diphtheria, but they were capable of transmitting the disease to less resistant persons if allowed to mix with the public. The details of the report are important.

When the Throat Inspector declares the culture free from diphtheria bacilli, the diphtheria sign is removed, and the infected rooms are disinfected by formaldehyde gas. Test cultures are placed in the rooms, and are returned by the house-holder after opening up the room. If the tests show that the germs have been destroyed, the house is declared free from infection; but if the cultures made from the tests cultures are found to contain germs, the fumigator repeats his work, unless the open condition of the room renders complete disinfection impossible.

The detailed report of the Superintendent of Disinfection, Major Geo. C. Wedderburn, shows the number of cultures made from the various houses reported for fumigation, and these results were as follows:

Negatives, 1,018; positive, 224; not returned, 132; returned without cotton, 4. Total, 1,378.

This report also contains some interesting figures concerning the different diseases for which fumigation was performed.

GROSS AND MICROSCOPIC EXAMINATION OF DISEASED FOOD PRODUCTS.

A number of specimens have been brought to the laboratory by the two abattoir inspectors for examination, and the following table shows the results of the gross and micro-

scopic examination. These specimens were mainly obtained from the Union Abattoir, receiving about 5,000 cattle weekly.

Human beings can contract such diseases as tuberculosis, actinomycosis (lump jaw), tape-worm, hydatid disease, and trichinosis from diseased animals used as food, and the examinations were made to detect the presence of such diseases.

Owing to the numerous other examinations devolving upon the one bacteriologist provided by the city, this work has been limited, and it is a pity that some special fund can not be found to extend this work, and determine the exact amount of diseased meat sold to the city consumers.

Table No. 8 shows the result of these examinations in detail.

TABLE No. 8.

Microscopic Examination of Food.

Abscess formation	4
Diseased skin (hog)	4
Tuberculosis	6
Actinomycosis	17
Carcinoma	1
Infection with B. bovisepticus	1
Milk	2
Normal	3
Total	38

CONCLUSIONS AND RECOMMENDATIONS.

The summary of the examination of the pump water shows that the sub-soil is thoroughly saturated with the seepage from the cess-pits. The results from the general supply show that the impounding reservoirs reduce the results of pollution of the water-shed somewhat, but that some intestinal and other bacteria still reach the consumer.

The examination of the milk supply indicates that milk is sometimes used which contains millions of bacteria. These numbers can be greatly reduced by proper handling of the milk at the farms, and methods of refrigeration. The Farrington acid tablets might give a general indication of the bacteriological condition of any given milk supply.

The work in the prevention and cure of diphtheria by antitoxin speaks for itself, but the physicians should be prompter in returning clinical blanks, and more willing to take cultures in suspected cases. The examination of nearly 50,000 specimens in seven years shows that the laboratory is considered of some practical use to the profession.

I would respectfully recommend that the list of the culture stations be somewhat revised, so that some of the outlying districts can be better supplied, and in order that several culture stations within 2 or 3 blocks of each other should not exist. The list given to physicians should be printed by wards, and the diagnosis of dysentery, respiratory infections other than tuberculosis, and uterine infections should be provided for by proper apparatus for that purpose.

I would also recommend that a small sum of money be used to pay for any investigation which might be of benefit to the city. Several valuable pieces of work have been already performed by competent persons without any pecuniary reward.

In conclusion I wish to express my appreciation of the faithful services of Mr. J. A. Campbell, Laboratory Clerk, and of Grover C. Benser, Laboratory Assistant.

Respectfully yours,

Wm. Royal Stokes, M. D.,
Bacteriologist to the Sub-department of Health.

REPORT

— OF THE —

Quarantine Hospital of the Port of Baltimore.

REPORT.

BALTIMORE, December 31, 1902.

JAMES BOSLEY, M. D., *Commissioner of Health.*

SIR—I have the honor to herewith submit the report of the Quarantine Hospital for the year ending December 31, 1902.

During the year nine hundred and eighty two vessels were boarded and inspected (see table 1), which is 25 less than in 1901, and from these vessels we have collected and paid into the City Treasury the sum of fifteen thousand six hundred and forty-three dollars and seventy-four cents ($15,643.74), (see table 2), which is two thousand one hundred and sixty-one dollars and eighty cents ($2,161.80) less than in 1901, and two thousand six hundred and sixteen dollars and eight cents ($2,616.08) less than in 1900, which shows a marked decrease in foreign tonnage entering this port in the past two years, which has appreciably reduced the revenues of this station.

Table 3 shows the number and class of vessels with sickness on board or from infected ports detained at quarantine for fumigation and disinfection. There were 27 in all, the large majority of which were vessels bringing iron ore from infected ports with charters to load at southern ports, where a detention of from three to five days would be enforced did they not ask for, and receive disinfection at this port, which is completed in six hours, and a certificate given, thereby saving the vessel several days delay at the port of loading.

Forty-three persons were received at this hospital during the year, thirty-five of whom were suffering from smallpox, and eight were quarantined because they had come in contact wtih the disease (see table 4), seven deaths occurred and one patient remains in the hospital.

The cost of maintaining the Quarantine Station for the year was, for salaries, $11,065, and for general expense, $7,560, making a total of $18,625, deducting the revenues derived from the shipping leaves the station an actual expense for the year, of $2,981, which, taking into consideration the decrease in the revenues from the shipping, as compared with 1900 and 1901, and the number of patients taken care of, is, I think, a remarkably good showing.

A very substantial launch was added to the equipment of the station and the "Hygeia" had a new boiler placed in her during the year. I must again call your attention to the necessity of barracks for the detention of suspects, the want of which has been greatly felt in the proper handling of vessels with quarantinable disease on board.

Through the courtesy of the Engineer of the Harbor Board, the tug "Baltimore" has on several occasions taken the place of the "Hygeia" when the latter had to go to the shop for repairs, thereby saving the cost of hiring a boat.

In conclusion, I desire to thank Dr. T. W. Clark for his assistance, and to say that the employees of the place have performed their duties in a manner deserving the praise of the department.

Very respectfully,

S. O. Heiskell, M. D.
Quarantine Physician.

TABLES.

TABLE No. 1.

Showing the Number of Vessels Boarded and Inspected at the Quarantine for the Year Ending December 31, 1902.

Months.	Class of Vessels.					
	Steamships.	Ships.	Barks.	Brigs.	Schooners.	Total.
January	43	.....	2	.....	.....	45
February	36	.....	.....	.....	1	37
March	48	2	5	.....	1	56
April	68	.....	2	.....	3	73
May	74	.....	3	.....	31	108
June	87	1	3	.....	55	146
July	79	.....	3	.....	29	111
August	83	.....	1	.....	12	96
September	85	.....	3	.....	14	102
October	66	.....	5	.....	6	77
November	60	1	3	.....	2	66
December	62	.....	3	.....	.....	65
Total	791	4	33	.....	154	982

TABLE No. 2.

Showing the amount of money received for Quarantine Fees and paid to the City Register for the Year Ending December 31, 1902.

Months.	Class of Vessels.					
	Steamships.	Ships.	Barks.	Brigs.	Schooners.	Total.
January	$ 852 81	.....	$13 25	.....	.....	$ 866 06
February	709 68	.....	.....	.....	$ 8 46	718 14
March	982 50	$30 89	34 94	.....	2 00	1,050 33
April	1,192 28	.....	13 57	.....	10 09	1,215 94
May	1,251 17	.....	19 06	.....	152 71	1,422 94
June	1,491 77	13 29	17 69	.....	206 46	1,729 16
July	1,363 67	.....	24 12	.....	139 51	1,527 30
August	1,582 38	.....	8 36	.....	91 45	1,682 19
September	1,578 49	.....	19 04	.....	84 75	1,682 28
October	1,234 87	.....	36 99	.....	28 30	1,300 16
November	1,213 49	24 92	17 15	.....	10 63	1,266 19
December	1,159 80	.....	23 25	.....	.....	1,183 05
Total	$14,612 91	$69 10	$227 42	.....	$734 36	$15,643 74

TABLE No. 3.

Showing the Number and Class of Vessels Detained at Quarantine for Cleansing and Disinfection for the Year Ending December 31, 1902.

Months.	Class of Vessels.					
	Steamships.	Ships.	Barks.	Brigs.	Schooners.	Total.
January	1					1
February	2					2
March	1					1
April	3					3
May					1	1
June	3					3
July	1					1
August	2					2
September	5				1	6
October	3					3
November						
December	4					4
Total	25				2	27

TABLE No. 4.

Showing the Number of Patients Treated at the Quarantine Hospital for the Year Ending December 31, 1902.

Disease.	Remaining over from 1901.	Received from 1902.	Discharged in 1902	Died in 1902.	Remaining in Hospital.	Total.
Smallpox	1	35	28	7	1	36
Quarantined	.....	8	8	.....	.....	8
Total	1	43	36	7	1	44

REPORT OF THE CHEMIST.

REPORT UPON THE CHEMICAL LABORATORY OF THE HEALTH DEPARTMENT FOR THE YEAR ENDING DEC. 31, 1902.

BALTIMORE MD., January 1, 1903.

DR. JAMES BOSLEY, *Commissioner of Health:*

DEAR SIR—Herewith I respectfully submit my report upon the Chemical Laboratory of the Health Department for the year 1902:

I.

MILK.

1. *Work Accomplished.*

The total milk examinations for 1902 amounted to 33,503 lots, aggregating 1,770,299 gallons. (See Table No. 1.) During 1901 the examinations amounted to 1,520,312 gallons, showing that with the same force—2 milk inspectors—250,000 gallons more milk have passed examinations as compared with 1901. Contrary to expectations, the total consumption of milk for 1902, roughly estimated, has been less than during the previous year (1901). The causes for this shrinkage are to be found—1st, in the failure of the hay crop and the very high prices of all feedstuffs, which forced a large number of dairymen to reduce their stock of cattle; 2d, in the advance in the price of milk, necessitating economy, especially among the poorer people; 3d, the remarkably cool summer of 1902, and a proportionate decrease in the consumption of ice cream. Thus the total consumption of milk for 1902 may be put down at about 7,500,000 gallons, which shows that about 24 per cent. of the milk handled in the city passed inspection.

2. *Quality of Milk.*

The total amount of milk condemned and spilled by the inspectors amounted to 557 lots, aggregating 2,944 gallons. (See Table No. 1.) Nearly 50 per cent. of this milk (1,441 gallons) was destroyed during the three summer months, June, July and August, not so much for being adulterated as for being found sour or churned at the railroad stations.

But taking into consideration the total amount of spills (2,944 gallons) and placing the total consumption at 7,500,000 gallons, only about .04 per cent. (4-100 of 1 per cent.) was condemned as unfit for use. Since the .04 per cent. is based upon about 24 per cent. of milk examined, and since it is reasonable to apply this as a ratio for the total amount of milk consumed in the city during the year, we find that over 99.8 per cent. constituted good, healthy and unadulterated milk, and that less than 2-10 of 1 per cent. was adulterated and unfit for use.

It is gratifying to state that the quality of the milk supply, as a whole, is at present in a very satisfactory condition. Following the lines indicated in my last report, your inspectors have been untiring in their efforts to secure for the public the pure and unadulterated article. The shippers of milk to the several railroad stations fully understand that they must deliver to the milk wagons pure and absolutely clean milk, and but very little trouble has been experienced during the year. At Calvert, Hillen and North avenue stations—which three stations furnish the bulk of the milk brought into the city by rail—frequently not a single gallon of milk was spilled during a whole month; whilst on the other hand, the milk shipped by a few old offenders, who insisted in shipping watered or filthy milk, was spilled day after day, until they either came to terms or were driven out of the market altogether.

Absolute cleanliness of cans and general sanitary conditions were insisted upon. Early in the year a different plan was adopted. Instead of simply spilling the milk at the depots when found wanting, your inspectors, whenever feasible, put themselves in personal touch with the shipper or his agent, and in a friendly but firm manner explained what was expected of them and what

the consequences would be. In cases where the shipper could not be commnnicated with at the depot, your Chemist addressed a letter to the offender. The way in which your inspectors—Messrs. Roth and Wilson—entered into this scheme is praiseworthy, and the results were most gratifying. With gentle but earnest persuasion, a great deal was accomplished, and this same method was extended to the owners or drivers of the milk wagons who deliver the milk to the consumer. During the inspections on the street the inspectors pointed out to the drivers of milk wagons or to the owners of city dairies that pure milk should register at least from 14 to 15 per cent. of total solids, and from 4 to 6 per cent. of butterfat; that that was what the railroads brought into the city and delivered to them and must not be tampered with, but delivered to the customers precisely as received. To the owners of dairies within or near the city limits who bring the milk direct into the city by wagons, the inspectors explained that cows fed on nothing but slop during the winter season, when pasturing is out of season, cannot furnish rich and wholesome milk; that the distillery slop must be mixed with middling, corn-chop, or other more substantial food. In short, the dairymen became gradually educated to what was expected of them, and since almost all of them were ready to listen and accept the warnings, the results as to the betterment of the quality of the milk surpassed our expectations. Another factor towards the improvement of the Baltimore milk supply which cannot be overestimated, and which has saved your inspectors and your Chemist a good deal of work and annoyance during the latter part of the year, is the passing of the cow-stable ordinance, which you so earnestly advocated.

During the summer of 1902 a number of investigations of a private nature, pertaining to the condition of the Baltimore milk supply, have been instituted, and in part published, which, if not fully understood as to their character, may be misleading.

There are in the city of Baltimore, say one thousand (more or less) small stores or shops, the great majority located in the poorer sections of the city, many in small basement apartments where cleanliness and satisfactory sanitary conditions are out of the question. Nearly all of these shops sell milk in small quantities.

Perhaps only a few of them handle as much as a five-gallon can of milk daily, purchased at one of the railroad stations at the wholesale figure. The rest get their milk supply from the wagons, a gallon or less, at a small discount. In either case, the milk as it is originally delivered to them is good, and has often passed a satisfactory examination by one of the inspectors. The shipper at the railroad station gives them the pure article, and the dairyman, whose route is certainly not confined to any particular section of the city, and who deals the milk out of his churn to all of his customers, rich or poor alike, cannot discriminate. Yet there is no denying the fact that the small amount of the milk dealt out over the dirty counters or tables of these places in one cent and two cent quantities is, in most cases, absolutely unfit for use, watered and filthy, dangerous to infants, and productive of disease. In many instances, proper refrigerators in summer are out of the question. The small quantity of milk which they handle is kept anywhere; the shop is often the living room of the family; children, possibly afflicted with some disease, attend to the customers, and the consequences are serious. Where lies the remedy? The milk inspectors, whose duty it is to control the milk supply of Baltimore, or as much of it as lies in their power, cannot spend the day in a small basement shop watching perhaps one gallon or one-half of a gallon of milk. If an inspector enters the store in the morning or shortly after the milk has been delivered, he may find the pure and unadulterated article. As soon as he turns his back the milk may be doctored, the quantity stretched to its utmost limit, and sold, in many instances perhaps, as food for infants. The only remedy which suggests itself; is to prohibit such places from selling milk at all, if such is feasible. Why mothers who are obliged to feed their infants on cow's milk will buy milk at such places is unaccountable indeed. The wagons of a dozen responsible and conscientious dairymen pass the door of any and every dwelling, may it be in the poorest or richest locality of the city, and for precisely the same figure the mothers can purchase as little as a pint or a half pint of pure and rich milk to feed their infants. I do not mean to create the impression that the small stores of which I was speaking had been neglected by the inspec-

tors. On the contrary, as often as their time permitted it, these places were visited while the inspectors were looking for milk wagons on the street, and sanitary conditions enforced, if possible; but it can readily be imagined that a thorough control is a matter of future development.

As usual, quite a large number of comparison analyses of milk were made during the year from samples taken at random out of cans at the railroad stations, or out of the churns of the milk wagons, which milk had passed a satisfactory inspection and was considered pure and unadulterated. Table No. 2 gives the result of 48 such analyses selected from the list. The average of the 48 samples shows 13.99 per cent. of total solids and 4.85 per cent. of butterfat. In former reports I have repeatedly called your attention to the advisability of raising the present legal standard from 12 per cent. of total solids and 3 per cent. of butterfat, as prescribed by ordinance, to at least 13 per cent. of total solids and 4 per cent. of butterfat. It would facilitate our work immensely and give us a much better chance to vigorously proceed against a number of unprincipled shippers and dealers, who manipulate the milk with the aid of the lactometer, and by removing part of the cream and adding water, keep the specific gravity above 1.0290.

3. *Microscopic Examination of Milk.*

The microscopic examination of milk offers no new features. A large number of samples of milk were examined during 1902 for the possible presence of pathogenic organisms for pus and for the relative number of ordinary milk bacteria. No tables were kept, because in not one case was the bacillus tuberculosis found present, and in only a few instances, in samples of bloody milk shipped at railroad stations, streptococci were located. Only a comparatively few samples were absolutely free from pus. Since the milk in the cans of the shippers or in the churns of the dealers cannot represent the product from one individual cow, it is rarely possible to keep the milk entirely free from pus. However, in most samples under examination, but very few pus cells were present.

When a cow is suffering from disease the milk, as it leaves the udder, may contain various pathogenic organisms; besides which milk after being drawn is particularly liable to infection by bac-

teria from various sources, and considering the great rapidity with which bacteria multiply in such an excellent medium as milk, it is surprising that instances of infection are not more numerous. In most cases, milk taken from a cow suffering from disease, even from an infection of the udder itself, shows no striking departure from the chemical composition of normal milk. The guarding against such an infection can only be accomplished by a thorough inspection of the cows and exclusion of diseased cattle from herds, or by the sterilizing or Pasteurizing of the milk before use. The daily inspection of the milk supply of a large city cannot offer any assistance, as bacteriological examination of milk for pathogenic germs often requires days, and in no instance could the milk under examination be detained long enough to enable the Bacteriologist to establish the fact whether or not pathogenic micro-organisms are present.

The actual number of ordinary micro-organisms in milk have little or no bearing on the quality of normal milk. Since many species of bacteria are capable of reproducing themselves in 20 minutes, and since milk is the most favorable medium for the reproduction, the number of bacteria present depend altogether upon whether the milk has been properly aerated and cooled immediately after milking—whether it is kept on ice, in a cool or warm place, and on the length of time it is kept before using. To enter more fully upon this subject is not in the scope of this report; besides, it has been fully ventilated and published by a large number of very able authorities.

Absolute cleanliness, beginning with the sterilizing of the teats and hands before milking, and ending with the actual use of the milk by the consumer, will do much towards keeping down the number of bacteria; but whether good normal milk contains one million or two million bacteria per cubic centimeter is unimportant, except as to the feeding of cow's milk to infants. In this latter case the modern achievements of sterilizing, Pasteurizing and modifying of milk are such that the introduction of disease through milk is hardly possible.

4. *Impure and Adulterated Milk.*

As usual, the principal adulteration consisted in the addition of water.

The large line of preservatives formerly used during the hot weather have almost entirely given way to the use of formaldehyde, this being the cheapest and most harmless of all preservatives. Whenever detected in milk, the offender was promptly notified and forced to discontinue its use. Outside of formaldehyde in only one case was boracic acid found to be present in milk. The practice of artificially coloring the milk by the use of azodyes has also greatly diminished, not a hundred gallons of milk having been spilled during the year on that account. In one case, where the party was caught in the act of adding the coloring fluid to the milk, the offender was promptly arrested and the fine imposed.

The amount of skim milk shipped to the several large bakeries from out of town creameries may be placed at about 400 gallons daily. Outside of this amount but little skim milk is handled in the city, and a careful watch was kept to prevent any possible fraud in this respect.

Your attention is called to a careful perusal of the work done by Mr. E. H. Schorer in the summer of 1902 at the Health Department laboratories, under the direction of Dr. Stokes and myself, and which you will find embodied in Dr. Stokes' report.

II.

Water.

1. *City Water Supply.*

Tables No. 3 and No. 4 illustrate fully the condition of the Baltimore water supply. The tables speak for themselves, and I leave it to you to draw your own conclusions. The presence of nitrites establish active decomposition of organic matter in the water and indicate intestinal pollution. In Table No. 3, out of 51 samples only 10 were free from nitrites, and 41 showed the presence of nitrites. The samples were procured not only from the laboratory taps, but from different localities of the city. But

whenever the chemical analysis was made at the same time and from the same tap, in conjunction with the bacteriological analysis by Dr. Stokes, and the colon bacillus was found to be present, with but very few exceptions the chemical analysis established the presence of nitrites.

Table No. 4 constitutes a number of analyses made from samples of tap water taken by the Health Wardens at the places indicated. Only two out of the eight samples were free from nitrites.

2. *Pumps, Springs and Wells.*

Table No. 5 enumerates the analyses of pumps, wells and springs examined. Only two out of 18 were free from pollution. All the rest were polluted to such an extent as to render the water absolutely unfit for potable purposes.

The bacteriological analysis of these polluted samples, with but few exceptions, gave concordant results: large number of bacteria and the presence of colon bacillus. In a few instances, however, this was not the case. For example: In one case, when the chemical analysis gave 180 parts of chlorine and 18 parts of nitrates, besides very high figures for free and albumenoid ammonia and nitrates; in short, when the chemical analysis pronounced the water "badly polluted," the bacteriological analyses resulted in the finding of hardly any bacteria and the absence of colon bacillus. The sample had a decided acid reaction, and whether this accounted for the discrepancy or what caused it, I am unable to say. Dr. Stokes and myself intend to take up the matter during the present year, and hope to be able to throw some light upon this subject.

3. *Sundry Water Analyses.*

Samples from two springs and one pump from the Industrial Home for Colored Girls, Melvale, Baltimore County—All three badly polluted and unfit for probable purposes.

Sample of water from St. Joseph's House of Industry—Polluted.

Sample of water from the premises of The Little Sisters of the Poor—Polluted.

Numerous samples of water from pumps or wells in homes—generally in the Annex—where typhoid fever existed, to establish the presence of intestinal pollution—No list kept.

The usual number of examinations of water out of cellars of houses, from ponds, cess-pools, etc., handed in by the Health Wardens and the Inspectors of Plumbing.

III.

Miscellaneous Work.

Among the large number of investigations of a miscellaneous character were samples of sausage, meats, fish, flour, butter, oleomargarine, cakes, candies, etc., and various articles of food which were suspected to have caused poisonous symptoms. Also disinfectants, paints, oils, etc. In reference to sausage, I beg to state that the war against artificially colored sausage has been kept up vigorously. Due to the untiring efforts of Mr. Charles Knell, "colored sausage is today a thing of the past." Only 3,576 lbs. of sausage were condemned during 1902, as against about 110,000 lbs. condemned during 1901.

The total number of analyses made at the chemical laboratory of the Health Department include:

Milk	447
Water—City water supply, pumps, wells and springs	178
Water—Cellars, ponds, cess-pools, etc	170
Sausage and meat	313
Coal	280
Miscellaneous	406
Total	1,794

The 280 analyses of samples of coal used by the various city departments have consumed a considerable portion of the time of your Chemist during 1902, and this will also apply to the present year. It has kept me very busy, and had it not been for the faith-

ful services rendered me by my assistant, Mr. R. De M. Taveau, I could not have done justice to the work pertaining to my position proper as Chemist to the Health Department.

Dr. Stokes, in his report, has made a comparison between my chemical and his bacteriological examinations of the water supply, and I deem it advisable to add a series of tables, which summarizes the results of the work done in my department from 1897 to the present day.

The Bacteriologist has demonstrated by his examinations that our sub-soil is thoroughly polluted by the seepage from our cess-pits. I beg to call your attention to the fact that the averages of chlorine, nitrates, free and albuminoid ammonia, and worst of all, the presence of nitrites, in a great majority of the pumps and wells shows a surprising excess of the products of decomposition. This demonstrates the complete saturation of the sub-soil by sewage, and this condition is well illustrated from a chemical standpoint by Table No. 6.

32 pumps, wells and springs examined during 1897 give an average of 106.16 per million of chlorine and 47.57 parts of nitrates. Analyses made during 1898 of the pumps and springs in Druid Hill and Clifton Parks fully illustrate the effects of the proximity of dwellings or stables upon the condition of the water in the underground currents.

77 pumps, wells and springs analysed during 1899 give an average of chlorine of 63.5 parts, nitrates 12.4 parts.

70 pumps examined during 1900 average in chlorine 49 parts. 7 pumps in 1901 give chlorine 83.5 parts. The figures for free and albuminoid ammonia were correspondingly high, and when we consider that with comparatively few exceptions nitrites were found to be present in all the samples under examination, we must realize the consequences which confront us in the near future.

Thanking you for your courteous treatment and your ever readiness to aid me in the performance of my work, I remain,

Yours, very respectfully,

G. W. Lehmann, Ph. D.
Chemist Health Department.

TABLES.

TABLE No. 1.

Total Amount of Milk Examined and Spilled.

1902.	Examined.		Spilled.	
	Lots.	Gallons.	Lots.	Gallons.
January	2,977	146,279	25	154
February	2,597	131,268	23	133
March	2,697	134,658	15	74
April	2,949	151,154	51	258
May	3,085	163,082	48	240
June	2,797	151,165	44	349
July	2,767	152,693	103	512
August	2,944	161,410	142	580
September	2,227	119,292	4	58
October	2,933	160,974	42	233
November	2,408	136,354	29	161
December	3,122	161,970	31	192
	33,503	1,770,299	557	2,944

TABLE No. 2.

Comparison Analyses of 48 Samples of Milk from Railroad Stations and Delivery Wagons.

1902.	Specific Gravity.	Solids.	Fat.	1902.	Specific Gravity.	Solids.	Fat.
January....	1.0300	14.25	5.10	July.....	1.0240	14.40	6.80
"	1.0295	13.90	4.65	"	1.0290	14.10	4.10
"	1.0305	14.15	4.80	"	1.0295	13.65	5.00
"	1.0285	14.30	4.15	"	1.0280	13.80	5.20
February...	1.0290	15.10	5.00	August.....	1.0285	12.04	4.20
"	1.0290	14.25	4.60	"	1.0290	13.45	4.20
"	1.0310	13.80	3.95	" .. .	1.0280	14.95	6.60
"	1.0295	14.00	4.00	"	1.0320	13.54	4.50
March	1.0310	14.20	4.10	September..	1.0270	15.20	7.80
"	1.0280	13.05	3.95	"	1.0290	14.04	4.70
"	1.0290	13.60	4.40	"	1.0290	14.65	4.40
"	1.0295	13.10	3.75	"	1.0285	13.65	4.65
April	1.0290	12.65	4.10	October....	1.0280	14.60	5.00
"	1.0310	14.05	3.60	"	1.0305	13.57	4.10
"	1.0280	13.19	4.20	"	1.0285	13.45	4.40
"	1.0290	13.80	4.50	"	1.0305	13.65	4.50
May.....	1.0280	13.65	5.00	November..	1.0345	15.00	5.20
"	1.0285	13.65	5.20	"	1.0320	13.95	4.00
"	1.0290	13.85	5.00	"	1.0295	14.12	5.50
"	1.0310	14.00	3.95	"	1.0290	15.10	6.50
June.....	1.0300	14.05	8.00	December..	1.0310	13.15	4.40
"	1.0320	13.45	4.40	"	1.0320	15.10	6.00
"	1.0300	13.85	5.20	"	1.0330	14.65	5.40
"	1.0300	14.00	4.60	"	1.0340	15.05	5.45

TABLE No. 3.

City Water Supply.

1902.		Volatile Solids.	Mineral Solids.	Total Solids	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.	Nitrites.	Required Oxygen.	Hardness.
January	8	64	55	119	4.05	0.05	0.11	0.71	Present.	2.14	48.60
	15	53	51	104	3.85	0.04	0.10	0.66	"	1.72	46.10
	22	52	52	104	3.65	0.04	0.14	0.70	"	1 80	46.00
	29	64	34	98	3.50	0.07	0.17	0.61	"	1.95	46.00
February	5	48	40	88	4.00	0.04	0.08	0.50	"	1.46	45.50
	12	57	47	104	3.90	0.05	0.15	0.83	"	1.85	46.00
	19	50	50	100	4.10	0.03	0.11	0.59	"	1.22	46.10
	26	61	43	104	3.95	0.04	0.16	0.72	"	1.74	47.80
March	5	66	36	102	4.16	0.04	0.10	0.76	"	1.44	49.20
	12	56	30	86	3.55	0.02	0.07	0.61	0.00	0.80	44.00
	19	59	40	99	3.80	0.06	0.12	0.70	Present.	1.90	51.00
	26	71	52	123	3.80	0.05	0.09	0.55	"	1.85	49.20
April	2	78	38	116	3.85	0.05	0.16	1.14	"	1.49	45.80
	9	55	40	95	3.16	0.03	0.12	0.88	"	0.95	46.00
	16	58	42	100	3.66	0.06	0.14	0.64	"	1.26	48.20
	23	65	55	120	4.05	0.05	0.10	0.48	"	1.53	48.00
	30	61	50	111	3.85	0.04	0.12	0.70	"	1.22	47.50
May	7	71	33	104	3.50	0.03	0.09	0.42	"	1.33	44.90
	14	50	40	90	3.10	0.03	0.10	0.51	0.00	0.95	46.01
	21	69	35	104	4.40	0.06	0.14	0.90	Present.	2.10	46.30
	28	49	39	88	3.90	0.05	0.15	0.62	"	1.23	49.00
June	4	57	39	96	4.00	0.04	0.12	0.60	"	1.08	50.10
	11	56	42	98	3.85	0.06	0.14	0.61	"	1.42	49.00
	18	50	46	96	4.04	0.05	0.10	0.83	"	1.11	51.50
	25	50	48	98	4.16	0.07	0.19	0.59	0.00	1.15	54.10

July	2	39	41	80	3.65	0.04	0.10	0.82	0.00	0.95	47.00
	9	40	36	76	3.50	0.06	0.14	0.56	Present.	0.90	47.10
	16	47	42	89	4.05	0.06	0.18	0.58	"	1.35	48.60
	23	49	48	97	4.10	0.11	0.14	0.60	"	1.10	48.40
	30	41	63	104	3.85	0.05	0.15	0.71	"	0.95	50.15
August	6	50	52	102	4.30	0.16	0.19	0.60	"	1.15	54.60
	13	45	51	96	4.00	0.06	0.16	0.45	0.00	0.90	50.50
	20	50	45	95	4.10	0.04	0.11	0.60	0.00	0.73	53.10
	27	49	36	85	3.00	0.05	0.09	0.50	0.00	0.80	51.00
September	3	41	29	70	4.80	0.08	0.18	0.72	Present.	0.95	48.60
	10	52	42	94	3.90	0.05	0.15	0.45	"	1.15	45.20
	17	60	34	94	4.20	0.05	0.20	0.50	"	1.40	50.20
	24	60	38	98	4.85	0.04	0.18	0.71	"	1.25	46.00
October	1	53	45	98	5.00	0.04	0.12	0.85	"	0.79	44.10
	8	45	58	103	4.50	0.10	0.16	0.60	0.00	1.20	48.10
	15	50	58	108	4.20	0.16	0.22	0.56	Present.	1.40	43.80
	22	40	35	75	3.20	0.04	0.08	0.72	0.00	0.85	46.20
	29	40	26	66	3.20	0.03	0.06	0.55	0.00	1.02	52.80
November	5	59	48	107	4.10	0.05	0.16	0.74	Present.	1.00	49.90
	12	72	20	92	4.20	0.04	0.16	0.82	"	1.21	51.10
	19	60	39	99	3.95	0.05	0.15	0.68	"	1.16	47.00
	26	55	45	100	3.80	0.08	0.20	0.53	"	0.80	48.05
December	3	46	46	92	3.20	0.11	0.16	0.55	"	0.95	45.90
	10	53	50	103	3.65	0.09	0.14	0.60	"	0.92	46.00
	17	48	24	72	3.00	0.12	0.19	0.60	"	0 89	47.60
	31	45	38	83	3.25	0.08	0.18	0.08	"	1.00	49.20

TABLE No. 4.

City Water Supply Taken from Taps, as Designated by Health Wardens, February, 1902.

1902.		Volatile Solids.	Mineral Solids.	Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.	Nitrites.	Required Oxygen.	Condition.	
Ward.....	13	82	74	156	5.60	0.04	0.11	1.20	Present	2.05	.....	248 Roland ave.
"	15	69	62	131	3.30	0.03	0.08	0.97	"	1.61	.....	1733 W. North ave.
"	17	46	45	91	4.20	0.03	0.08	0.90	0.00	1.16	.....	601 Pennsylvania ave.
"	20	60	53	113	2.80	0.03	0.07	1.23	Present	1.68	.....	1916 W. Pratt st,
"	21	69	33	102	4.00	0.04	0.10	1.01	"	1.56	.....	1110 S. Paca st.
"	22	72	48	120	3.50	0.05	0.12	1.00	"	1.94	.....	128 W. Conway st.
"	23	69	50	119	3.30	0.04	0.10	0.87	0.00	1.60	.....	1508 S. Chester st.
"	24	69	53	122	4.00	0.03	0.12	0.95	Present	1.85	.....	1417 Riverside ave.

TABLE No. 5.—PUMPS, WELLS AND SPRINGS.

	1902.		Volatile Solids.	Mineral Solids.	Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.	Nitrites.	Condition.
Pump:											
200 block Hickory avenue.....	June.....	14	188	66	254	43.50	0.04	0.16	14.12	Present.	Bad.
Spring:											
Wyman's wood.....	"	14	32	62	94	11.00	0.05	0.12	1.16	"	Bad.
Wells:											
Ridgewood and Garrison aves..	"	21	138	78	216	16.40	0.01	0.19	5.00	"	Bad.
111 Stafford street..... ...	July	10	.....	.....	.....	6.20	0.11	0.26	.....	"	Bad.
1613 Hopkins avenue.....	"	10	.....	.....	.....	180.30	0.21	0.42	18.20	" !!	Very bad.
Pumps:											
Twenty-seventh and Oak sts ...	"	15	.....	.....	.....	30.10	0.18	0.30	.....	"	Bad.
2852 Pennsylvania avenue.....	"	19	.....	.....	.....	47.30	0.07	0.21	16.25	" !!	Very bad.
Spring:											
Foot of Reservoir st., D. H. Park	"	31	260	98	358	49.20	0.85	1.90	10.00	" !!!	Very bad.
Pumps:											
Gilston and Franklin roads....	August....	25	.....	.....	.....	20.60	0.04	0.11	1.24	"	Bad.
Franklin road.....	"	25	.....	.....	.....	19.30	0.06	0.14	0.85	"	Bad.
Edmondson avenue extended ..	"	25	.....	.....	.....	30.40	0.05	0.11	9.20	"	Bad.
Gelston Heights and Franklin avenue.....	"	25	... ..	.....	.....	5.10	0.03	0.09	0.45	0.00	Good.
Franklin road	"	25	.....	.....	.....	4.00	0.09	0.14	0.60	Present.	Bad.

TABLE No. 5.—PUMPS, WELLS AND SPRINGS—Continued.

	1902.		Volatile Solids.	Mineral Solids.	Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrites.	Nitrites.	Condition.
Well:											
Gilmor lane and Twenty-ninth street	September.	9	64	52	116	30.50	0.08	0.42	6.15	Present.	Bad.
Pumps:											
242 Sycamore avenue	"	16	.....	.....	.....	25.10	0.05	0.24	10.20	"	Bad.
244 Sycamore avenue	"	16	.....	.....	.....	24.60	.....	.....	.....	"	Bad.
246 Sycamore avenue	"	16	.....	.....	.....	24.60	.....	.....	.....	"	Bad.
2500 North avenue	"	24	56	118	174	10.20	0.04	0.11	0.69	0.00	Good.

TABLE No. 6.

Analyses of Pumps, Wells and Springs in Druid Hill Park. Figures Expressed in Parts Per Million.

Druid Hill Park.	Color.	Odor.	Reaction.	Matter in Suspension.	Total Residue 230° F.	Volatile Residue.	Ignited Residue.	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites.	Sulphates as SO_3.	Required Oxygen.	Hardness.	Character of Water.
Pump No. 1	Clear	None	Acid	0.00	348	260	88	54.06	0.00	0.12	9.44	0.00	0.85	2.50	90.42	Polluted.
" " 2	Murky	None	Neutral	44.20	118	54	64	13.64	0.18	0.35	0.58	0.00	4.50	0.54	45 21	Polluted.
" " 3	Murky	None	Neutral	16.80	132	62	70	2.95	0.09	0.24	0.60	trace.	0.00	0.58	58.91	Polluted.
" " 4	Cloudy	Sulphate hydrogen	Neutral	26.12	88	20	68	2.56	0.03	0.06	2.28	0.00	0.16	0.95	39.73	Good.
" " 5	Murky	None	Neutral	36.80	108	46	62	2.86	0.11	0.05	0.38	0.00	0.00	0.56	42.47	Suspicious.
" " 6	Clear	None	Neutral	0.00	62	26	36	2.11	0.02	0.38	0.40	0.03	0.00	1.81	42.20	Polluted.
" " 7	Clear	None	Neutral	19.65	146	40	106	3.24	0.02	0.08	0.22	0.00	0.00	0.74	61.65	Good.
" " 8	Clear	None	Slightly acid	0.00	262	156	106	38.16	0.04	0.15	15.25	0.00	0.90	0.61	76 72	Polluted.
" " 9	Dirty	Musty	Neutral	61.12	134	92	42	9.51	0.00	0.12	0.14	0.00	0.00	5.35	86.31	Not good in present condition.
" " 10	Dirty	Foul	Neutral	91.10	182	58	124	3.89	0.00	0.35	0.92	0.00	0.00	11.52	126.04	Polluted.
" " 11	Clear	None	Neutral	0.00	156	68	88	3.21	0.00	0.06	0.70	0.00	2.14	0.47	78.83	Good.
" " 12	Clear	None	Neutral	0.00	186	70	116	6.75	0.04	0.12	1.10	0.00	3.15	0.86	93.16	Good.
" " 13	Slightly murky	None	Neutral	21.00	214	80	134	5.40	0.00	0.12	0.20	0.00	0.10	0.95	89.70	Good.
" " 14	Clear	None	Neutral	0.00	128	50	78	4.31	0.00	0.09	0.05	0.00	0.00	0.65	41.40	Good.
Edmund's Well	Clear	None	Neutral	0.00	134	44	90	1.26	0.00	0.00	0.14	0.00	2.28	0.22	58.91	Very good.
Silver Spring	Clear	None	Acid	0.00	298	216	82	75.20	0.00	0.09	1.85	0.00	5.60	3.58	99.01	Polluted.
Mountain Pass Spring	Clear	None	Neutral	0.00	114	43	71	3.55	0.02	0.03	0.16	0.00	0.00	0.46	43.84	Good.
Chrise's Fountain	Clear	None	Neutral	0.00	106	44	62	2.84	0.00	0.02	0.34	0.00	0.00	0.14	56.70	Very good.

TABLE No. 6—Continued.

Analyses of Pumps and Springs in Clifton Park. Figures expressed in parts per million.

Clifton Park.	Color.	Odor.	Reaction.	Matter in Suspension.	Total Solids 230° F.	Volatile Residue	Ignited Residue	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites.	Sulphates os SO_3.	Required Oxygen.	Hardness.	Character.
Pump, Golf Links.....	Murky ..	Musty ...	Neutral..	18.50	162	92	70	4.85	1.28	2.64	0.22	0.00	0.00	3.38	68.17	Polluted.
Spring, Gardener's house.	Clear....	None	Neutral..	0.00	66	32	34	4.65	0.00	0.00	3.95	0.00	0.00	0.12	43.16	Very good.
Spring, Washington st....	Clear...	None ...	Neutral..	0.00	97	59	38	11.64	0.00	0.02	4.16	0.00	0.00	0.22	67.14	Good.
Pump at stable.....	Clear....	None ...	Neutral..	0.00	96	74	22	9.78	0.14	0.15	8.25	0.10	0.00	0.70	59.09	Polluted.
Pump, Mansion house...	Clear....	None....	Neutral..	0.00	44	20	24	5.05	0.02	0.06	0.62	0.00	0.14	0.42	31.74	Good.

TABLE No. 6.

Analyses of Water from Polluted Pumps or Wells Analyzed During 1897, Figures Expressed in Parts per Million.

	Volatile Solids.	Mineral Solids.	Total Solids.	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites
Carroll street	38	19	57	7.45	0.02	0.18	0.20	0.08
Parkdale and Woodberry avenue	67	128	195	13.49	0.09	0.15	12.50	Trace
1025 York road	283	655	938	93.60	0.14	0.24	132.77	Trace
Charles street avenue tollgate	133	80	213	42.24	0.21	0.08	38.56	0.00
1030 Huntingdon avenue	434	582	1,016	159.75	0.46	0.58	137.92	0.08
Mt. Olivet lane	308	183	491	96.21	0.05	0.07	39.60	0.00
515 Roland avenue	320	316	636	163.30	4.15	2.60	15.00	0.09
Park Heights	122	104	226	59.88	0.10	0.25	4.24	Trace
513 Madison street, Waverly	165	72	237	74.55	0.02	0.03	16.50	0.00
Oakford avenue and Garrison lane	81	51	132	42.60	0.00	0.04	9.20	0.00
734 Gorsuch avenue, Waverly	464	567	1,031	268.85	0.42	0.70	252.00	0.04
420 Falls road	183	82	265	44.02	0.04	0.09	10.50	0.00
182 Old York road	434	181	615	115.02	0.12	0.15	28.00	0.02
Fifth avenue, Hampden	245	111	356	43.66	0.03	0.15	98.50	0.00
109 Millington lane	510	395	905	167.56	0.05	0.12	95.00	Trace
Calloway and Fairview avenue	53	48	101	6.74	0.75	1.15	0.05	0.00
3 Kennedy lane	212	108	320	44.37	0.00	0.06	19.70	0.00
545 Quarry avenue	738	296	1,034	156.91	0.00	0.10	45.50	0.00
2826 Lanvale street	276	172	448	51.12	0.00	0.05	18.60	0.00
207 Carroll street	342	114	456	58.22	0.00	0.12	19.50	0.00
59 Mount street	286	92	378	60.35	0.00	0.08	26.40	0.00
Chesterwood	668	766	1,434	688.70	0.00	0.00	0.05	0.00
311 Falls road	256	106	362	38.34	0.04	0.10	14.25	0.00
Franklin Terrace and Old York rd.	148	54	202	48.28	0.02	0.09	0.90	0.00
Linden Heights	61	78	139	40.82	0.00	0.00	15.20	0.00
Liberty street, Waverly	82	126	208	12.78	0.12	0.28	0.85	0.00
166 Old York road	260	195	455	97.27	0.20	0.42	45.50	0.00
Penwood Iron Pump	574	212	786	278.67	0.18	0.35	0.55	0.00
1005 Second street, Calverton	256	126	382	118.57	0.21	0.18	42.50	0.45
149 Chestnut avenue	312	122	434	98.69	0.04	0.10	116.42	Trace
Mount street, near Baker	678	548	1,226	171.11	1.25	0.10	214.50	0.18
112 Frisby street	154	104	258	34.08	0.04	1.11	51.20	0.00

TABLE No. 6—Continued.

Taps, Streams or Wells.	Date.	Laboratory Number.	Total Solids.	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites.	Conditions.
	1899.								
Pump, Patterson Park	April 4	270	538	93.50	0.12	0.38	156.20	0.02	Bad.
Pump No. 1, Carroll Park	" 4	271	252	35.10	0.46	0.62	54.10	0.04	Bad.
Pump No. 2, " "	" 4	272	278	24.45	0.00	0.08	50.40	0.00	Fairly good
Pump No. 3, " "	" 4	273	192	17.52	0.80	0.71	20.40	0.09	Bad.
Pump, No. 1116 Winchester street	" 22	286	10.18	102.50	0.35	0.60	42.16	0.03	Bad.
Pump, No. 2503 Eutaw Place	" 22	287	78	9.45	0.00	0.03	0.05	0.00	Good.
Pump, No. 2323 Linden avenue	" 22	288	160	34.40	0.04	0.07	0.70	0.00	Good.
Pump, No. 201 West Monument street	" 25	290	396	67.55	0.35	0.40	16.50	0.09	Bad.
Pump, No. 204 Dolphin street	" 25	291	608	88.00	2.95	3.08	19.25	0.00	Bad.
Pump, No. 2852 Pennsylvania avenue	" 25	280	290	36.10	0.00	0.02	4.60	0.00	Good.
Pump, No. 2858 " "	" 25	281	138	19.20	0.05	0.12	4.16	0.00	Fair.
Pump No. 9, Baker Property	May 10	282	220	45.10	0.35	0.71	1.15	0.05	Bad.
Pump No. 11, Thomas and North avenues	" 10	284	532	140.65	0.52	0.62	1.75	0.04	Bad.
Pump, No. 2826 Lanvale street	" 12	287	603	62.40	0.02	0.05	18.50	0.03	Bad.
Pump No. 18, Liberty road	" 20	291	270	23.50	0.00	0.00	0.15	0.00	Good.
Pump No. 19, " "	" 20	292	326	37.16	0.02	0.04	1.15	0.00	Good.
Pump No. 20, " "	" 20	293	494	31.40	0.00	0.00	1.25	0.00	Good.
Pump No. 21, " "	" 20	294	162	6.42	0.00	0.00	0.00	0.00	Very good.
Pump No. 22, " "	" 20	295	250	16 70	0.00	0.06	1.35	0.00	Good.
Pump No. 23, Slingluff avenue	June 5	296	680	18.50	0.00	0.00	0.00	0.00	Good.
Pump No. 25, " "	" 5	297	620	59.00	1.84	2.16	26.14	0.15	Bad.
Pump No. 26, " "	" 5	298	290	21.10	0.00	0.00	0.16	0.00	Good.

Pump No. 27, Slingluff avenue	June	5	299	280	19.50	0.00	0.00	0.10	0.00	Good.
Pump No. 29, " "	"	5	301	237	18.50	0.00	0.00	0.64	0.00	Good.
Pump No. 32, Windsor ave. & Eleventh st.	"	15	302	150	44.50	0.00	0.00	0.00	0.00	Good.
Pump No. 33, Liberty road	"	15	303	92	43.50	0.00	0.00	0.00	0.00	Good.
Pump No. 34, Beach avenue	"	15	304	154	44.50	0.00	0.00	0.00	0.00	Good.
Pump No. 35, Tenth street	"	15	305	164	44.50	0.00	0.00	0.00	0.00	Good.
Pump No 36, Beach avenue	"	15	306	136	41.00	0.00	0.00	0.00	0.00	Good.
Pump, No. 2517 Pennsylvania avenue	"	17	307	746	167.50	1.28	2.06	65.20	0.14	Bad.
Pump, No. 2651 " "	"	17	308	10.54	327.50	2.16	1.46	68.40	0.00	Bad.
Pump, No. 2659 " "	"	17	309	896	208.50	2.38	2.14	42.10	0.02	.....
Pump, cor. Penna. ave. and Clifton st.	"	17	310	730	230.00	0.42	0.31	49.20	20.06	Bad.
Pump, No. 1577 Clifton street	"	17	311	570	240.50	0.62	0.90	71.16	0.07	Bad.
City Laboratory Tap	"	18	312	106	5.30	0.02	0.05	0.62	0.00	.....
Bull Mansion	"	18	313	274	50.51	0.04	0.07	0.78	0.00	Fair.
Pump, Pulaski street and Liberty road	"	30	314	550	110.00	0.00	0.06	21.50	0.00	Suspicious.
Pump, cor. Pennsylvania and Fulton aves.	"	30	315	600	161.50	0.15	0.27	28.00	0.07	Bad.
Pump, No. 201 Bloomingdale avenue	"	30	316	630	112.50	0.04	0.03	35.10	0.00	Suspicious.
Pump, No. 701 " "	"	30	317	370	116.40	0.02	0.03	30.20	0.00	Suspicious.
Pump, Butcher's lane	"	30	318	552	162.00	0.35	0.67	35.50	0.03	Bad.
Pump, Slingluff avenue	July	6	319	300	22.00	0.00	0.00	0.21	0.00	Good.
Pump, Slingluff avenue	"	6	320	184	14.20	0.00	0.00	0.10	0.00	Good.
Pump, St. Peter's Cemetery	"	6	321	510	90.40	0.10	0.19	0.13	0.02	Bad.
Pump, Liberty road	"	6	322	150	16.40	0.00	0.02	0.05	0.00	Good.
Pump, Liberty road	"	6	323	786	207.50	0.08	0.16	30.40	0.00	Bad.
Pump, No. 2858 Pennsylvania avenue	"	27	324	506	19.60	0.03	0.08	0.20	0.01	Bad.
Pump, No. 2824 Pennsylvania avenue	"	27	325	600	96.14	0.05	0.09	5.30	0.10	Bad.
Pump, Elgin avenue	"	27	326	384	23.50	0.02	3.95	3.15	0.00	Bad.
Pump, Elgin avenue	"	27	327	270	6.50	0.00	0.00	1.13	0.00	Good.
Pump, Elgin avenue	"	27	328	548	91.50	0.00	0.00	0.00	0.00	Good.
Well, West Arlington	"	27	329	192	20.16	0.05	0.08	0.15	0.00	Fair.
Spring, Edmondson avenue	"	27	330	205	6.85	0.00	0.00	0.00	0.00	Good.
Pump, Hermitage, G. H.	Aug.	11	331	280	22.10	0.00	0.00	0.05	0.00	Good.
Spring, Hermitage, M. H.	"	11	332	220	11.25	0.00	0.00	0.08	0.00	Good.
Spring, Evergreen	"	11	333	244	9.60	0.00	0.00	0.15	0.00	Good.
Pump, Poplar Hill	"	11	334	420	71.40	0.04	0.06	0.40	0.00	Bad.

TABLE No. 6—Continued.

Taps, Streams or Wells.	Date.	Laboratory Number.	Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.	Nitrites.	Conditions.
Spring, No. 2715 West North avenue.....	" 12	335	270	16.50	0.00	0.00	0.00	0.00	Good.
No. 71, Thomas Weeks.....	" 11	336	120	6.00	0.15	0.33	1.55	0.00	Bad.
No. 72, G. G. Armour.....	" 11	337	130	5.20	0.20	0.40	2.18	0.00	Bad.
No. 73, W. H. Diffenderfer.....	" 11	338	124	7.00	0.18	0.40	1.00	0.00	Bad.
No. 74, West Arlington, S. P	" 11	339	90	4.20	0.20	0.16	0.55	0.00	Bad.
H. water, No. 280 West Baltimore street..	" 19	340	124	7.00	0.43	0.87	0.00	0.00	Bad.
S. P., Arlington Tap.....	" 19	341	120	5.16	0.00	0.00	0.00	0.00	Good.
Western Pump House.....	" 19	342	110	5.10	0.02	0.00	0.00	0.00	Good.
High Service, Druid Hill Park.....	" 19	343	108	4.95	0.00	0.00	0.00	0.00	Good.
Druid Hill Lake....	" 19	344	114	5.40	0.00	0.00	0.00	0.00	Good.
S. P., Arlington Bottom..... ..	" 19	345	118	5.92	0.05	0.11	0.65	0.00	Bad.
Lake Roland, Towson Br.....	" 19	346	152	9.08	0.02	0.07	0.10	0.00	Fair.
Jones' Falls, G. S. Bridge	" 19	347	105	7.10	0.00	0.00	0.00	0.00	Good.
Pump House, L. R.....	" 19	348	144	6.40	0.10	0.05	0.80	0.00	Bad.
Br., from Lake Side, L.R.....	" 19	349	83	8.05	0.00	0.00	0.40	0.00	Good.
Conduit Gate House, L. R.....	" 19	350	159	7.00	0.15	0.18	1.15	0.00	Bad.
Middle Lake Roland.....	" 19	351	214	6.14	0.35	0.20	1.16	0.00	Bad.
Pump, 31st st. and Remington ave.....	" 22	352	.....	40.16	0.45	0.87	0.05	trace	Bad.
Cottage avenue, Warfield.....	" 29	353	100	11.06	0.00	0.00	0.14	0.00	Good.
Pump, No. 722 York road.....	Sept. 5	354	194	10.65	0.00	0.00	0.13	0.00	Good.
Pump, No. 3210 Cedar avenue.....	" 14	355	940	151.10	1.15	0.57	0.19	0.05	Bad.
Pump, No. 3441 Chestnut avenue.....	" 14	356	374	68.10	0.00	0.00	0.10	0.00	Fair.
City Water Lab. Tap..... ...	" 25	357	90	3.14	0.02	0.07	0.04	0.00	Fair.

Pump, 1st T. G., Liberty road	Oct.	31	358	756	94.50	0.05	0.09	0.11	0.09	Bad.
Pump, 9th and Pressbury streets	"	31	359	149	5.10	0.02	0.05	0.00	0.00	Good.
Pump, Clifton avenue extended	"	31	360	120	9.16	trace	0.07	0.09	traces	Suspicious
Pump, North avenue and 11th street	"	31	361	270	30.60	0.00	0.00	0.00	0.00	Good.
Hydrant, No. 1223 East North avenue	Nov.	29	362	84	6.15	0.00	0.04	0.12	trace	
Hydrant, Park avenue	"	29	363	80	4.29	0.00	0.00	0.09	trace	
Pump, Riggs avenue extended	"	29	364	344	32.18	0.00	0.05	0.15	trace	Suspicious.
Pump, Riggs avenue extended	"	29	365	810	75.10	0.00	0.15	0.65	0.05	Bad.
Pump, Riggs avenue extended	"	29	366	806	213.50	0.14	0.26	0.25	0.04	Bad.
Pump, Riggs avenue extended	"	29	367	390	67.75	0.00	0.00	0.05	0.00	Fair.
Pump, Riggs avenue exlended	"	29	368	450	93.75	0.00	0.00	0.18	0.00	Suspicious.
Pump, Riggs avenue extended	"	29	369	120	16.00	0.00	0.00	0.05	0.00	Good.
Lab. Tap., City Water	Dec.	5	370	103	3.82	0.02	0.05	0.14	traces	Bad.

TABLE No. 6—Continued.

Pumps, Wells, Springs.	Date.	Laboratory Number.	Total Solids.	Volatile Solids.	Mineral Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.	Nitrites.	Condition.
	1900.										
Pump—2508 Mosher street, extended.	March 12	381	301	204	61	.59 20	.....	...	0.90	.....	Suspicious.
2516-18 Mosher st., extended.	" 12	382	684	460	224	143.0	0.06	0.14	13.30	.....	Bad.
2534 Mosher street, extended.	" 12	383	562	350	212	82.50	0.05	0.09	12.60	.....	Bad.
Mrs. Ray, Riggs ave., ext...	" 12	384	151	99	52	29.0	.....	....	0.61	.....	Good.
Mrs. C. Flanagan, Riggs ave.	" 12	385	160	41	119	33.0	.....	0.09	0.53	.....	Suspicious.
1007 2d st., N. W. Annex...	" 12	386	160	76	84	23.60	.....	....	.....	... .	Fairly good.
Bull Mansion, Whitehurst..	" 29	387	261	192	69	50.26	.....	0.09	0.54	.....	Fair.
2402 Riggs avenue.....	" 31	388	336	100	236	78.0	0.02	0.06	4 16	... .	Suspicious.
2542 Mosher street.....	" 31	389	704	541	163	165.0	traces.	0.07	16.20	....	Bad.
1 Third street, extended....	" 31	390	360	220	140	56.50	.....	....	3.54	.....	Suspicious.
5 Third avenue.....	" 31	391	190	136	54	18.20	.....	....	2.51	.....	Fair.
13 Third avenue.....	" 31	392	340	190	150	55.40	.....	...	4.21	.....	Fair.
1104 Third avenue.....	" 31	393	130	70	60	34.20	.....	....	.....	.....	Good.
2800 Lafayette avenue.....	" 31	394	251	158	93	43.20	.....	....	0.40	.....	Fair.
1022 Bloomingdale road ...	" 31	395	407	271	136	75.50	.....	....	0.78	.....	Suspicious.
Purnell, Bloomingdale road.	" 31	396	304	186	118	49.50	0.08	0.22	.....	.....	Bad.
Perry, Bloomingdale road..	" 31	397	260	110	150	19 0	.....	....	0.65	.....	Good.
Brayshaws, Franklin road..	April 25	398	326	210	116	38.16	0.06	0.09	12.40	traces.	Bad.
Williamson, Franklin road.	" 25	399	920	616	304	118.0	0.06	0.14	34.16	.....	Bad.
Tyler, Franklin road.....	" 25	400	62	38	25	2.41	0.09	0.07	.....	.....	Fair.
Gerkin, Franklin road	" 25	401	714	432	282	91.45	0.02	0.06	41.25	.....	Bad.
Cross, Riggs avenue, ext ...	" 27	402	572	443	129	171.0	0.07	0.14	64.25	.....	Bad.

Pump—2508 Mosher street.....	April	27	403	384	313	91	64.20	.....	0.19	39.50	.....	Bad.
2534 Mosher street	"	27	404	580	382	198	91.20	0.02	0.12	40.45	.....	Bad.
Flanagan, Riggs avenue, ext	"	27	405	156	49	107	31.55	0.05	0.09	16.90	.....	Bad.
2542 Mosher street.....	"	27	406	719	561	158	181.	.....	0.10	44.50	.....	Bad.
Ninth and Pressbury sts....	May	7	407	164	85	79	9.10	0.03	0.04	.....	.....	Good.
1022 Bloomingdale road....	"	7	408	419	291	128	72.14	.....	0.06	24.60	present	Bad.
Clifton avenue, ext	"	7	409	127	43	84	16.40	0.04	0.16	.....	present	Bad.
White, North avenue, ext ..	"	7	410	284	179	105	11.14	0.06	0.08	....	present	Bad.
Nixon, Franklin road.....	"	18	411	512	336	176	63.15	0.15	0.27	14.50	present	Bad.
849 Franklin road	"	18	412	354	242	112	55.16	0.08	0.10	15.20	.....	Bad.
Busby, Franklin road.....	"	18	413	734	380	354	148.50	0.35	0.55	9.10	.....	Bad.
McCormick, Franklin road .	"	18	414	382	200	182	87.0	traces	0.06	0.55	.... ..	Fairly good
812 Franklin road	"	18	415	500	160	340	106.0	.....	....	0.09	present	Bad.
Sharett's, Easter lane	June	5	417	216	138	78	59.55	.....	....	15.45	trace	Bad.
Lutz, Easter lane.	"	5	418	544	282	262	1.80	0.05	0.11	12.0	.....	Bad.
Workinger, Easter lane	"	5	419	234	160	74	83.50	.....	....	11.0	trace	Bad.
Quick, Easter lane.....	"	5	420	566	354	212	153.0	0.04	0.07	14.0	present	Bad.
Mitchell, Liberty road	"	5	421	206	160	46	125.0	.....	....	13.0	.....	Suspicious.
2800 Lafayette avenue	"	5	422	242	172	70	104.50	trace	0.07	16.24	present	Bad.
Quarantine.....	"	19	423	142	81	61	11.0	trace	0.02	.....	.....	Good.
Spring—Quarantine	"	19	424	142	81	61	11.0	trace	0.02	.....	.....	Good.
Pump—Hartman, Easter lane... ..	"	19	425	286	172	114	106.60	.....	....	6.00	trace	Bad.
Abraham's, Easter lane	"	19	426	372	198	174	85.20	.....	....	9.0	.....	Suspicious.
No. 1 Purnell	"	19	429	360	174	186	114.60	0.30	0.70	14.0	.....	Bad.
No. 2 Purnell	"	25	430	332	166	166	108.0	0.23	0.45	12.0	.....	Bad.
127 Brady avenue, Waverly.	July	12	432	....	....	....	215.70	.....	0.12	3.00	present	Bad.
Collier, Reisterstown road..	"	16	433	552	278	274	139.90	0.02	0.21	3.00	.....	Bad.
Reed, Reisterstown road....	"	16	434	202	76	126	31.0	.....	0.02	2.00	.....	Fair.
Schaeffer, Reistertown road.	"	16	435	276	102	174	57.60	.....	0.10	5.00	.....	Suspicious.
Fix, Reisterstown road.....	"	18	436	340	148	192	91.00	0.03	0.19	6.00	.....	Bad.
Disney, Reisterstown road..	"	18	437	370	180	190	103.50	.....	0.09	6.00	.....	Bad.
Carey, Clifton avenue.....	"	19	438	104	39	65	15.60	.....	....	.....	.....	Good.
Penhurst and Eldorado aves.	"	19	439	164	38	126	11.90	.....	0.02	....	.....	Good.
2852 Pennsylvania avenue..	"	19	440	108	72	36	17.80	.....	0.03	.....	.....	Good.

TABLE No. 6—Continued.

Pumps, Wells, Springs.	Date.	Laboratory Number.	Total Solids.	Volatile Solids.	Mineral Solids.	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites.	Conditions.
	1900.										
Pump—Murphy, Irvington	July 21	441	164	102	62	26.50	.....	....	9.00	.....	Good.
Odenwald, Irvington	" 21	442	132	80	52	27.80	.....	0.03	6.00	.....	Fair.
Keefer's spring, Irvington	" 21	443	144	58	86	20.00	.....	0.05	.....	.....	Good.
Well—13 S. Frederick street	" 24	444	442	242	200	219.10	12.80	....	11.00	.....	Bad.
Spring—Fresh Air Society	" 24	445	100	56	44	21.50	.....	....	.....	.....	Good.
Pump—Phillips, Hillen road	Aug. 1	448	243	168	75	77.80	.....	0.15	11.00	.....	Bad.
121 Brady avenue	" 28	450	380	291	89	19.40	present	....	7.00	.....	Bad.
Yeakle, N. Walbrook	" 31	451	....	....	....	23.00	.....	....	.....	.....	Good.
Gwynn Oak	Sept. 10	452	330	240	90	2.30	0.50	1.20	.....	.....	Bad.
Campbell, Harford rd-house	" 10	454	64	40	24	20.00	0.00	....	0.50	.....	Fairly good
Campbell, Harford rd-stable	" 10	455	...	....	....	43.00	.	0.04	4.00	present	Bad.
Well—Quarantine, No. 1	Oct. 16	456	30	14	16	8.00	0.50	0.60	.....	.....	Good.
Quarantine, No. 2	" 16	457	30	12	18	7.80	0.04	0.05	.....	.....	Good.
Pump—Bosworth, Hoffman lane	Nov. 17	459	142	89	53	13 50	0.14	0.29	.....	.....	Bad.

TABLE No. 6—Continued.

Name and Locality.	Condition.	Total Solids.	Volatile Solids.	Mineral Solids.	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites.	Sulphates as $S. O_3$	Required Oxygen.	Character.
C. E. Wooden, 214 Cold Spring lane..	Clear Odorless Neutral	212	132	80	33.50	0.00	0.09	4.00	0.00	0.55	1.86	Bad.
Richard Beeler, Shirley lane, Reisterstown road.....	Clear Odorless Neutral	458	200	258	163.00	0.02	0.09	5.00	0.00	16.00	3.49	Bad.
Wm. Breckenridge, Shirley lane.....	Cloudy Odorless Neutral	114	46	68	7.50	0.05	0.16	0.00	0.00	0.00	1.51	Fair.
G. W. Gail, Pimlico road.....	Clear Odorless Neutral	260	106	154	48.00	0.00	0.08	0.00	0.00	0.00	0.95	Bad.
Daniel H. Whitney, Shirley lane.....	Cloudy Odorless Neutral	280	150	130	168.00	0.02	0.06	4.00	0.00	9.00	2.10	Bad.
Wm. Ludwig, Shirley lane.....	Clear Odorless Neutral	220	74	146	37	0.00	0.05	0.00	0.00	0.00	0.73	Fair.
E. C. Bosworth, Hoffman lane, east of Carroll	Clear Odorless Neutral	310	202	108	127	0.06	0.18	20.06	0.00	0.00	3.20	Bad.
Quarantine, artesian well.....	Clear Odorless Neutral	54	6	48	4.50	0.00	0.00	0.00	0.00	0.00	0.18	Very good

TABLE No. 6—Continued.

Name and Locality.	Condition.	Total Solids.	Volatile Solids.	Mineral Solids.	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Nitrates.	Nitrites.	Sulphates as SO_3.	Required Oxygen.	Character.
J. S. Spence, 1022 Bloomingdale road	Clear Odorless Sl. Acid	384	230	154	59	0.20	0.34	9.00	Pres't	0.00	.....	Bad.
Lydecker's pump...	Clear Odorless Neutral	126	94	32	10.10	0.00	0.06	0.00	0.00	0.00	.....	Fair.
Dieterich's pump...	Clear Odorless Sl. Acid	566	500	66	117.10	0.11	0.14	21.99	Pres't	0.00	.....	Very bad.
Owen's Distillery pump.....	Very cloudy Odorless Acid	810	614	196	174.40	0.06	0.18	0.00	Pres't	0.00	.....	Very bad.
Catonsville water, Irvington..	Very cloudy Odorless Neutral	192	50	142	4.50	0.04	0.15	0.00	0.00	0.00	.....	Good.

TABLE No. 6—Concluded.

Location.	Sample Taken.	Total Solids.	Volatile Solids.	Mineral Solids.	Chlorine.	Free Ammonia.	Nitrites.
Light street bridge (at foot of bridge)	P. M.	3455	594	2861	1490	Abundant.	0.009
	A. M.	9414	1619	7795	4060	"	0.015
Light street bridge (at draw bridge)	P. M.	9183	1579	7604	3960	"	0.013
	A. M.	10064	1730	8334	4340	"	0.010
Fort McHenry (at water front)	P. M.	5356	921	4435	2310	"	0.010
	A. M.	10898	1874	9024	4700	"	0.009
Fort McHenry (60 feet from water front)	P. M.	6608	1136	5472	2850	"	0.015
	A. M.	11733	2017	9716	5060	"	0.008
Public baths (at water front)	P. M.	4081	702	3379	1760	"	0.031
	A. M.	9322	1603	7719	4020	"	0.024
Public baths (60 feet from water front)	P. M.	4521	778	3743	1950	"	0.027
	A. M.	10713	1842	8871	4620	"	0.019

Note.—The sample in every case was more or less muddy, and possessed a musty odor.

Report of Division of Plumbing and Drainage.

BALTIMORE, MD., January 1, 1903.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—I have the honor to submit my report of the Division of Plumbing and Drainage for the year ended December 31, 1902. The appended statement will show the number of permits issued, and the inspections made:

Number of permits for plumbing	2,014
" " to drain closets	2 126
" inspections of plumbing	705
" sanitary inspections	612
" applications approved from City Engineer's office	823
" notices to abate nuisances	178

Respectfully submitted,

JOSEPH C. MITCHELL,
Superintendent.

Report of Throat Inspector.

BALTIMORE, MD., January 1, 1903.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—I have the honor to herewith submit a report of work done during the year 1902.

Number of cultures taken	1,905
Negative	1,808
Positive	97
Number of houses visited	782
Positive (without showing clinical diphtheria)	36

Respectfully,

ALAN W. SMITH,
Throat Inspector.

Report of Inspectors of Food.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—We have the honor to report that during the year ended December 31, 1902, we made the following inspections and condemnations of foods:

MONTHS.	Store.	Markets.	Slaughter house.	Abattoirs.	Fruits and Vegetables.	Meats.
January	1,062	111	65	77	.....	6,398
February	1,041	109	51	74	.....	7,634
March	1,041	109	51	74	3,150	6,909
April	913	104	51	71	1,200	5,326
May	1,073	110	60	76	4,535	6,341
June	1,094	113	40	83	5,646	9,278
July	947	118	42	124	42,770	14,382
August	1,054	110	40	107	7,350	13,450
September	1,054	110	40	107	2,950	7,466
October	971	117	35	114	2,150	9,241
November	971	117	35	114	3.700	15,538
December	971	117	35	114	.....	10,685
Total	12,173	1,345	545	1,135	73,451	112,848

Respectfully submitted,

CHARLES KNELL,
WILLIAM B. ROTH,
C. M. BRODWATER,
C. A. LERIAN,
Food Inspectors.

Report of the Nuisance Clerk.

BALTIMORE, MD., December 31, 1902.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—Please find report of work done in this department for the year 1902.

1902.	Permits to clean privies.	Number of loads to Foley's dump.	Number of loads to Winan's dump.	Number of loads to both dumps.
January	4,327	1,081	4,946	6,027
February	1,943	414	1,937	2,351
March	10,168	.....	7,651	7,651
April	11,756	.....	11,295	11,295
May	10,118	.....	11,049	11,049
June	8,101	.....	7,880	7,880
July	5,948	.....	6,842	6,842
August	4,229	.....	5,451	5,451
September	3,547	.....	4,861	4,861
October	3,261	.....	4,376	4,376
November	2,749	.....	3,664	3,664
December	2,247	.....	3,212	3,212
Total	68,394	1,495	73,164	74,659

There has been only one dump for reception of night soil since March 1, 1902.

Number of persons presented for violation of Section 101 Article 23 Baltimore City Code 2

Number of books disinfected 97

Respectfully,

F. X. JENKINS,
Nuisance Clerk.

Report of the Inspector of Bakeries.

BALTIMORE, January 1, 1903.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—I have the honor to report that during the year ended December 31, 1902, I inspected 3,144 bakeries, and ordered 141 of them to be cleaned.

Respectfully submitted,

HENRY J. HAHN,
Inspector of Bakeries.

Report of the Keeper of the Morgue.

BALTIMORE, January 1, 1903.

To the Commissioner of Health:

Report for the year 1902 of the City Morgue:

Number of bodies received		262
White	159	
Blacks	109	
Males	212	
Females	50	

Ages from 1 day to 1 year	9
1 year " 10 "	8
11 " " 20 "	16
21 " " 30 "	62
31 " " 40 "	52
41 " " 50 "	59
51 " " 60 "	31
61 " " 70 "	18
71 " " 80 "	2

CAUSES OF DEATH.

Apoplexy	15	Nephritis	3
Fracture skull	5	Tuberculosis	14
Consumption	8	Toxaemia	1
Pneumonia	9	Menningitas	1
Accident	11	Suffocation	2
Gunshot wound	12	Aunerism of Arta	1
Typhoid fever	6	Peritonitis	4
Bright's disease	7	Suicide	10
Drowned	37	Poison	3
Arteros Selerosis	1	Cut by knife	1
Rheumatism	2	Calangitis	1
Heart failure	13	Cardia failure	3
Burns	4	Heat stroke	1
Phthisis	4	Lockjaw	1
Exposure	2	Diarrhoea	2
Struck by cars	13	Cholera Infantum	1
Hemorrhage	6	Asthenia	2
Convulsions	1	Congestion of lungs	2
Asphyxia	6	Shock	2
Sencope	2	Cancer	1
Heart disease	6	Paralysis	2
Asthma	6	Rupture of liver	1
Exhaustion	8	Inanition	1
Alcoholism	2	Still births	13

Bodies buried by friends	157
Bodies buried by city	109
Bodies now at the Morgue	3
Post mortems by Dr. N. G. Keirle, M. D.	38

PATRICK R. GLYNN,
Superintendent.

Report of the Commissioner's Clerk.

BALTIMORE, January 1, 1903.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—I have the honor to submit herewith an account of the work done by me during the year ended December 31, 1902:

Number of letters sent out	2,516
Number of notices sent to physicians	2,250
Number of notices sent to undertakers	140
Number of notices sent to hospitals	52
Number of notices sent to hotels	125
Number of notices sent to public schools	10,000
Number of notices sent to parochial schools	4,800
Number of notices sent to private schools	800
Number of notices sent to dispensaries	1,000
Total	21,683

Number of culture tubes delivered to city stations ... 7,560

Respectfully submitted.

ELEAZER GOLDBERG,
Commissioner's Clerk.

Report of the Inspector of Dairies.

BALTIMORE, January 1, 1902.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—I have the honor to submit my annual report for the year ended December 31, 1902; at the beginning of the year I found on inspection that there were 394 stables within the city limits housing cows for private use, and for dairy purposes.

During the year 107 dairymen sold their cows and discontinued business, leaving 287 stables at the end of the year. There are ten dealers in Milch cows in the city.

I am pleased to say that there seems to be a general disposition on the part of the dairymen to comply with the regulation of this department, but I found it necessary to cause the arrest of three dairymen for failure to comply with the regulation, two of whom were fined, while one was released by the magistrate on his promise to comply in the future with the regulation.

I condemned five cows and had them removed from stable. During the year I gathered fifty samples of milk for analysis in laboratories. My inspections included 3,031 visits to stables and 16,204 examinations of cows.

Respectfully submitted.

GEO. F. SCHULTZ,
Inspector of Dairies.

Report of the Index Clerk.

HEALTH DEPARTMENT.

DIVISION COMPLAINTS OF NUISANCES; FUMIGATIONS; FOOD AND GUARD EXPENSES; AND THE PAUPER-DEAD.

BALTIMORE, January 1, 1903.

JAMES BOSLEY, M. D.,
Commissioner of Health of Baltimore City:

SIR—I herewith most respectfully submit a report for the year ending December 31, 1902, of that division of your department in my charge, including all direct complaints of nuisances in a tabulated form, classified by wards, showing an increase in number of 925 over 1901; a table of fumigation, and their results, classified by both streets and diseases; statement of the costs of food, and guard service in cases of infectious and contagious diseases, all of which I hope will satisfactorily explain themselves, in comparison with the year preceding.

I also annex a full statement of all smallpox cases, including, in addition to those sent to the Quarantine station, a list of suspects, held during the year at the Detention Hospital; lists of clothing, etc., fumigated and destroyed, together with a detailed report of the pauper-dead, and other bodies that have come under your care and control, and the disposition of the same. There is a complete record in this division covering all possibly ascertainable facts in each and every case. The tables show where they came from, their disposition, also the names and places of burial of those reclaimed by families, friends or associations for private burial, after having come into your custody under the law

for pauper burial; number buried in Potter's Field, and the number turned over to the Board of Anatomy for scientific purposes in compliance with law. The comparative coffin account will show the saving in cost for the past two years of $1,088.31 over the year 1900, notwithstanding the fact that the cost as shown for 1902 leaves the Department with a sufficient number of coffins to meet our requirements until June 30, 1903.

In addition to the above I will state that the custom of the Department in the past was to furnish all guards meals and car tickets. Your new rule to furnish meals *alone* to smallpox guards, and only car tickets to diphtheria and scarlet fever guards, has resulted this year in reducing these expenses $125.55, viz: in meals $98.25 and $27.30 in car tickets, which with the coffin curtailment has made a total reduction of $1,213.86, not to speak of a material reduction in food costs over previous years.

COMPLAINTS CLASSIFIED BY WARDS FOR THE YEAR 1902.

Complaints.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Totals
Alleys	6	5	13	45	27	12	11	52	12	13	41	37	22	46	16	35	18	41	21	29	6	10	9	7	534
Cellars	9	16	52	36	66	24	26	56	13	24	29	34	23	27	39	19	12	41	45	10	38	54	9	17	719
Drainage	7	....	....	7	2	3	1	5	5	3	2	6	2	11	15	8	3	2	2	1	....	3	3	....	91
Filth	7	4	9	33	30	6	4	22	5	...	17	3	4	16	12	8	3	15	8	2	8	12	5	2	240
Gutters	2	3	6	5	3	2	....	6	....	2	4	6	1	4	11	....	2	4	3	3	1	1	2	1	72
Garbage	2	5	.. .	9	4	4	1	4	1	...	....	4	...	....	2	2	....	....	3	1	1	1	1	3	48
Gas	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	2	....	....	....	....	3
Grass	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Hydrants	....	1	....	...	1	2	4	...	...	5	....	....	....	....	8	....	....	2	....	....	....	1	1	....	25
Ice	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	2
Lots	2	....	1	1	7	1	....	2	2	2	1	8	4	7	13	2	....	2	3	1	2	1	2	2	66
Manure	....	....	....	3	1	1	1	....	2	...	3	4	1	3	....	3	6	....	1	2	1	2	2	2	38
Nuisances	17	16	27	65	36	13	13	14	11	20	28	18	15	36	37	25	20	23	28	19	10	19	10	14	534
Privies	32	64	137	159	182	90	101	129	72	86	142	125	69	124	168	205	96	88	144	49	28	54	26	25	2395
Roofs	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	1	....	....	1	....	....	4
Spouts	....	2	...	2	....	....	3	4	7	1	...	...	2	....	....	1	5	....	2	....	2	....	....	....	31
Sewers	1	1	....	4	3	....	....	....	....	2	1	5	10	2	....	....	....	1	....	....	....	3	2	6	41
Streets	1	2	2	2	1	1	....	....	1	....	3	3	1	1	6	1	....	2	....	2	2	1	2	....	34
Sidewalks	1	....	....	1	....	1	....	....	4	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	8
Stables	5	....	2	2	2	3	2	2	2	4	5	1	1	2	....	....	1	3	2	1	....	1	1	3	45
Stagnant Water	1	...	4	....	6	....	2	4	1	3	8	5	1	3	9	8	....	2	1	....	10	3	2	2	75
Paving	....	1	....	1	....	....	....	....	1	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	5
Pipes	....	....	....	....	4	....	1	1	....	....	2	....	....	....	1	2	1	....	....	1	3	1	1	....	18
Water	4	7	8	16	8	3	4	6	4	.	8	6	2	7	8	6	3	2	7	3	....	5	2	1	120
Yards	10	2	10	31	20	3	7	17	13	10	15	7	11	14	9	11	11	15	15	3	6	1	....	4	245
Totals	107	129	271	422	403	169	181	324	156	175	309	280	170	303	357	337	181	243	286	129	119	174	80	89	5394

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Ann	5	.....	.....	5
Arlington avenue	1	.....	2	3
Aliceanna	8	.....	.....	8
Albemarle	4	5	.....	9
Aisquith	8	11	.....	19
Ashland avenue	4	6	1	11
Argyle avenue	1	1	.....	2
Anthony	.....	1	.....	1
Appleton	1	.....	.....	1
Addison alley	2	.....	.....	2
Augusta avenue	1	.....	.....	1
Bank	4	2	1	7
Bernard	1	.....	.....	1
Broadway	7	6	.....	13
Brunswick	1	.....	.....	1
Brick Hill	.....	.....	1	1
Bond	9	6	.....	15
Belair avenue	2	.....	.....	2
Baltimore	9	5	5	19
Bolton	1	2	1	4
Bloomsbury	3	.....	.....	3
Bradford	5	3	.....	8
Bruce	2	.....	.....	2
Baker	3	3	....	6
Barney	2	.....	.....	2
Barclay	5	3	1	9
Bloomingdale road	1	1	1	3
Biddle	.....	2	6	8
Bethel	5	1	.....	6
Barre	3	.....	.....	3
Belt avenue	1	.....	.....	1
Brunt	1	.....	.....	1
Bowen	2	.....	.....	2
Battery avenue	2	.....	.....	2
Bokee	.....	3	.....	3
Barnes	.....	1	....	1
Brown's lane	1	.....	.....	1
Bohemia Court	1	.....	.....	1
Chase	2	2	.....	4
Cathedral	.....	1	.....	1
Charles	4	9	3	16
Central avenue	3	3	1	7
Carried forward	115	77	23	215

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	115	77	23	215
Chapel	6	2	2	10
Cross		1	2	3
Calvert	6	3	3	12
Church	2			2
Carrollton avenue	3		1	4
Clifton		3		3
Caroline	7	6	2	15
Calhoun	1	1		2
Carey	2	2	1	5
Canton avenue	8			8
Collington avenue	3	1		4
Chester	8	3		11
Colvin		2		2
Chestnut avenue	4	1	1	6
China alley	1			1
Conway	1	1	1	3
Cedar avenue	12			12
Courtney			1	1
Curley	1			1
Constitution			1	1
Castle	1	1		2
Crystal avenue		1		1
Clifford	2			2
Cemetery lane		1		1
Camden	4	1		5
Clipper avenue	1			1
Chesapeake	2			2
Columbia avenue	2	1	1	4
Christian	1			1
Cambridge	1			1
Covington	3	1		4
Cannon	5			5
Carlyle place	1			1
Cole	1			1
Carroll	2			2
Callow		1		1
Coke			1	1
Clement	1		1	2
Durham	9	2	2	13
Druid Hill avenue	4	1	2	7
Decatur	1			1
Carried forward	221	113	45	397

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	221	113	45	397
Dallas	7			7
Donnelly Court	1			1
David avenue	2			2
Delwood avenue	1			1
Division	1			1
Dorsey lane		1		1
Durst	1			1
Duncan alley	1			1
Eastern avenue	9	1		10
Edmondson avenue	3	6		9
Exeter	5	11		16
Evergreen Terrace	1			1
Eager	2	4		6
Eutaw Place	2	1	3	6
Eutaw street	2	1	2	5
Eden	2	6	1	9
East avenue	2			2
Ellicott			1	1
Essex	1			1
Ensor		2		2
Elm	4			4
Edgar Place	2			2
Franklin	6	3	2	11
Frederick avenue	7	1	1	9
Fayette	10	16	4	30
Fifth avenue	1		1	2
Fulton avenue	11	2	2	15
Francis		1		1
Forrest Park		1		1
First avenue	1			1
Fort avenue	3	3		6
Falls road	4	2		6
Forrest	3	2		5
Fremont avenue	2	2		4
Fawn	3	5		8
Federal	2	3		5
Front	6	5		11
Fairmount avenue	4	1	1	6
Fell	3			3
Fait	2			2
Carried forward	337	193	63	512

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	337	193	63	512
Franklin Terrace			1	1
Fourth avenue	1			1
Foster	1			1
Gay	3	9		12
Gough	6	1	1	8
George		1		1
Gallagher's Court	1			1
Gilmor	3	6		9
German	1			1
Greene			1	1
Greenmount avenue	2	2		4
Granby	5	1		6
Gorsuch	1	1		2
Gutman avenue	1			1
Gold		1		1
Girard avenue			1	1
Grindall	1			1
Hamburg	5	1		6
Hopkins avenue	1		1	2
Hamilton	2			2
Howard	4			4
Henrietta	1			1
Harrison	3	3		6
Harlem avenue	3	3	3	9
Hoffman	4	2		6
Holbrook	4	4		8
Hakesley	1	1		2
Hughes		1		1
Hickory avenue	3			3
Hillen	2	1		3
Hudson	4			4
High	8	11	1	20
Harford road	1	1		2
Huntingdon avenue	6			6
Hampden avenue	1			1
Haw	2			2
Hanover	1	1	1	3
Harris alley	4			4
Homewood avenue	1			1
Hooper avenue	2			2
Carried forward	426	244	73	668

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	426	244	73	668
Hill		2		2
Hare	1			1
Henry	1			1
Jefferson	4	2		6
Jenkins alley	1			1
Jackson Square	3	1		4
Keyser		1	1	2
Kossuth			1	1
Leadenhall	1			1
Lehman	3	1		4
Lanvale	5	6	2	13
Low	5	5		10
Lamley	3			3
Linden avenue	4		1	5
Landwehr's lane	1			1
Lafayette avenue	11	3		14
Lexington	2	2		4
Light	2	2		4
Leloup	2			2
Liberty road		1		1
Little Church			1	1
Lombard	15	5	3	23
Lemon	1	1		2
Luzerne	1	3	2	6
Lee	4			4
Laurens	1	2		3
Lakewood avenue	1			1
Loudon avenue	3	1		4
Monument	3	2	1	6
Madison	1	8	2	11
McDonough	1			1
McCulloh	2	1	1	4
Milliman	2	1		3
Mulberry	4	4		8
Montford avenue	7			7
Marshall	2			2
Maryland University			1	1
Myrtle		1		1
Marsh Market Space	2			2
Monroe	5	2	1	8
Milton avenue	2	4		6
Carried forward	532	306	90	852

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	532	306	90	852
Maryland avenue	1	2	.....	3
Monmonier court	2	.....	.....	2
Mason's alley	1	.....	.....	1
Mt. Royal avenue	2	1	3	6
Mosher	2	1	.....	3
Medairy	2	1	.....	3
Mount	1	2	.....	3
Madison avenue	1	1	1	3
Morris	1	.....	.....	1
Mullikin	1	.....	.....	1
Maldeis	2	.....	.....	2
Maempel lane	1	.....	.....	1
Marriott	2	.....	.....	2
Moyer	1	.....	.....	1
McHenry	2	2	.....	4
McElderry	2	4	2	6
McMechen	.....	1	.....	1
McKim	1	.....	.....	1
Mura	1	1	.....	2
North avenue	6	5	2	13
Newington avenue	2	2	.....	4
Oxford avenue	2	.....	.....	2
Oak	2	.....	.....	2
Old Frederick road	1	.....	.....	1
Oliver	.....	1	.....	1
Orchard	3	.....	.....	3
Orleans	1	1	.....	2
O'Donnell	1	.....	.....	1
Ostend	.....	1	.....	1
Park avenue	3	2	2	7
Paca	4	1	.....	5
Patterson Park avenue	13	3	.....	16
Preston	4	3	.....	7
Pratt	6	7	.....	13
Pennsylvania avenue	4	4	1	9
Pentland place	1	.....	.....	1
Pleasant alley	2	1	1	4
Pitcher	.....	3	.....	3
Pulaski	2	.....	.....	2
Poppleton	2	.....	.....	2
Parrish alley	1	1	.....	2
Carried forward	618	357	102	1.000

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	618	357	102	1,000
Pierce	1		2	3
Presstman	2		1	3
Parkwood avenue	1	1		2
Peabody	1			1
Port	2			2
Pinkney	1			1
Portland	1			1
Payson		1		1
Patapsco	2			2
Parkin	1			1
Peach alley		1		1
Penhurst	1			1
Plymouth	1			1
Ramsay	6			6
Register	2	2		4
Rose	3	1		4
Ridgewood avenue	1			1
Roland avenue	5	1	2	8
Riverside avenue	3	2		5
Railroad avenue	3		1	4
Richland	1			1
Rogers aveuue	1		1	2
Ridgely	3			3
Reese	1			1
Rose Hill		1		1
Robert		1		1
Riggs avenue		1		1
Ringgold			1	1
Randall	1			1
Rayner avenue		3		3
Richardson		1		1
Rock	1			1
Race	2			2
Stricker	7	4	1	12
St. Paul	5	1	2	8
Spring	3	8		11
Stafford	1			1
Second avenue	4			4
Saratoga	9		2	11
St. Peter			1	1
Sargeant	2			2
Carried forward	696	386	116	1,121

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	696	386	116	1,121
Spruce alley	.....	.....	1	1
Salem	3	.....	.....	3
Sharp	.....	2	.....	2
Stockholm	5	.....	.....	8
Schroeder	6	1	1	8
Shuter	2	.....	1	3
Smallwood	1	.....	.....	1
Somerset	2	1	.....	3
Scott	.....	1	.....	1
St. Ann	.....	1	.....	1
Stone Hill	2	.....	.....	2
Sarah Ann	1	.....	.....	1
Stiles	1	.....	.....	1
Stevenson	1	.....	.....	1
Twenty-eighth	1	1	.....	2
Townsend	2	1	1	4
Third avenue	4	.....	.....	4
Twenty-seventh	.....	.....	1	1
Twenty-third	3	1	1	5
Trinity	1	.....	.....	1
Thirty-fifth	1	1	.....	2
Twenty-second	3	.....	.....	3
Twentieth	3	.....	1	4
Thames	1	.....	.....	1
Twenty-first	.....	1	.....	1
Turner Place	2	.....	.....	2
Tremont avenue	.....	1	.....	1
Twenty-ninth	1	.....	.....	1
Thomas avenue	.....	.....	1	1
Twenty-fourth	1	.....	.....	1
Twenty-sixth	1	.....	.....	1
Union avenue	1	.....	.....	1
University Hospital	.....	.....	10	10
Vinion avenue	1	.....	1	1
Vine	1	1	.....	2
Valley	.....	1	.....	1
Wolfe	16	3	.....	19
Westphal	1	.....	.....	1
Washington	8	14	1	23
Wirt	.....	1	.....	1
Wedgecliff Cottage	.....	.....	1	1
Carried forward	772	418	137	1,292

FUMIGATIONS FOR YEAR CLASSIFIED BY STREETS—Con'd.

Streets.	Diphtheria.	Scarlet Fever.	Miscellaneous.	Total.
Brought forward	772	418	137	1,292
Woodley	.....	.....	1	1
Woodyear	7	.....	.....	7
Williams	4	.....	.....	4
Webster Court	.....	.....	1	1
Wattermyer Court	1	.....	.....	1
Watson	1	1	.....	2
Walker	1	.....	.....	1
Water	1	.....	.....	1
Walbrook avenue	4	.....	.....	4
West	3	.....	.....	3
Wilson	.....	2	.....	2
White	4	.....	.....	4
Willow	1	2	.....	3
Wilkens avenue	5	.....	.....	5
York road	1	1	1	3
Totals	805	424	140	1,334

FUMIGATIONS CLASSIFIED BY DISEASES.

Years Compared.	1901	1902
Bright's disease	.....	1
Cancer	1	5
Chickenpox	1	3
Diphtheria	1,042	816
Erysipelas	14	2
Gangrene	.....	1
Leprosy	1	.....
Lockjaw	.....	1
Measles	8	12
Mumps	1	.....
Paralysis	1	.....
Pneumonia	.....	2
Scarlet fever	320	422
Smallpox	.....	14
Septicemia	.....	2
Sore throat	1	.....
Tuberculosis	58	76
Typhoid fever	10	15
Unknown	5	5
Whooping cough	2	1
Total	1,465	1,378

RESULTS OF FUMIGATIONS.

Years Compared.	1901	1902
Negatives	832	1,018
Positives	288	224
Unreturned tubes	324	132
Returned empty	21	4
Total	1,465	1,378

FOOD PURCHASED.

Owing to the quarantining Smallpox and Diphtheria premises during the years the Department supplied food for the quarantined, purchasing same as follows:

	1901	1902
Wm. F. DeKalb	$13 00	.....
Evans & Co.	6 71	.....
Fishel & Wright	86 78	$140 67
Mrs. Roemer	.....	3 78
J. H. Cronhardt	.....	6 72
J. P. Benson's Sons	.....	6 37
S. Funk	.....	2 47
Economy Meat Co.	.....	1 85
*J. B. Weilage	.....	116 40
*Hotel Lexington	.....	74 35
Totals	$106 49	$352 61

*This $190.75 was for food furnished the twenty-four suspects detained at Detention Hospital, together with meals furnished their guards, which leaves only $161.86 expended by the Department for the forty-two inmates quarantined in private houses, against $106.49 for 1901, or only $55.37 more in 1902 where there was thirty-five cases of smallpox against fourteen in 1901.

COMPARATIVE STATEMENT—COFFINS COST.

Months.	1900	1901	1902	Remarks.	
January	$61 65	$61 80	$3 80	Saving in cost in	
February ...	63 05	14 05	2 70	1901 over 1900...	$520 93
March	47 95	13 30	3 80		
April	90 40	19 00	.....	Saving in cost in	
May...	54 70	7 60	1 90	1902 over 1901...	567 38
June	57 05	17 60	5 75		
July	68 45	36 40	1 80		
August. ...	67 70	3 80	.....		
September ..	54 95	1 90	.....		
October ...	43 73	10 00	.....		
November...	56 65	.....	.....		
December...	43 90	3 80	123 05*		
Totals	$710 18	$189 25	$142 80	Total saving. $1	088 31

*Amount paid in lump July to December, 1902, inclusive, leaving enough coffins on hand to last until June 30, 1903.

GUARD EXPENSES.

The following persons were employed at various times during the year for Special Guard Duty in cases Smallpox and Diphtheria, where it was necessary to quarantine the other inmates.

	1901	1902
B. F. Andrews	$ 53 50	$ 138 49
Patrick Duff	30 25	.....
Theo. Eichoff	176 90	321 00
Geo. F. Frazier	4 00	314 60
H. M. Hunter	9 25	30 00
Geo. R. Royston	50 75	.....
W. H. Wooden	4 75	51 47
A. Reinhardt	.....	241 01
Wm. McCormick	.....	95 51
W. P. Stafford	.....	87 25
Lewis Golden	.....	107 60
Chas. McKnabb	.....	7 25
N. Bailey	.....	95 75
C. H. Burrows	.....	131 95
E. V. Dunn	.....	28 88
John Walker	.....	86 75
H. C. Livington	.....	166 60
Peter Bunn	.....	3 50
John Luck	.....	77 33
J. B. Scott	.....	2 85
	$329 40	$1,987 79

DISEASES GUARDED, Etc.

And Respective Expenses from above.

	1901	1902
Diphtheria	150 40	170 18
Scarlet fever	93 62	35 77
Smallpox	53 75	1,602 06
Erysipelas	.....	30 00
Other diseases	.....	5 89
*Burning mattresses	.....	24 00
*Fumigations	21 63	5 13
*Duty on dead wagon	10 00	114 76
	329 40	1,987 79

*The guards also did these things when necessary.

LIST OF SMALLPOX PATIENTS—1902.

Names.	Date Received.	Date Discharged.	Date Died.	Where From.	Born.	Color.	Age.
Benjamin Hawkins...	Feb. 2	Mar. 12	.....	219 Spring street.	N. Carolina.	B.	23
Henry Wilson.....	" 3	" 26	.....	Friendly Inn.	S. Carolina.	"	24
Thomas Berry.....	" 3	Feb. 26	.....	" "	Jamaica.	"	20
James Edison.....	" 5	Mar. 12	.....	Steamship "Vedamore."	Nebraska.	"	43
Charles Hall.....	" 5	Feb. 26	.....	" "Jessup."	S. Carolina.	"	24
James Tometty.....	" 5	" 26	.....	" "Vedamore."	Ireland.	W.	42
James Higney.....	" 5	Mar. 17	.....	" "Indore."	"	"	29
Martha J. Barrenger..	" 7	" 15	.....	18 W. L. Church street.	N. Carolina.	B.	48
Edgar Stott.....	" 11	" 26	.....	Pennsylvania.	Tennessee.	"	23
George Brown.....	" 16	.....	Feb. 22	106 Market space.	Jamaica.	"	24
George Menze.....	" 17	Mar. 15	.....	256 Roland avenue.	Maryland.	W.	17
Mary Barrenget.....	" 21	" 15	.....	20 E. Little Church street.	N. Carolina.	B.	22
Oliver Allison.....	" 22	" 15	.....	410 E. Pratt street.	Illinois.	W.	39
James Hiland.....	" 26	.....	Mar. 6	Somerset County, Md.	Maryland.	B.	20
W. Rashanowsky... .	Mar. 14	Mar. 29	.....	Steamship "Frankfort."	Russia.	W.	24
John T. Downey	" 14	.....	Mar. 27	517 Little Greene street.	Maryland.	"	60
Edward Hicks.....	" 29	.....	April 7	Howard County, Md.	Virginia.	B.	55
James Small	" 30	.....	" 7	Camden and Light streets.	Baltimore.	"	81
King H. Wall.....	" 30	May 3	.....	206 Rogers avenue.	N. Carolina.	"	28
Albert Sumner.....	April 12	" 17	.....	Independence Camp, Pa.	"	"	26
Asa Carter.....	" 21	.....	May 7	Sparrows Point.	Virginia.	"	20
Mamie Shepard.....	" 24	May 10	.....	1631 Pierce street.	"	"	24
James J. Toner.....	" 29	June 14	.....	427 Saratoga street.	Dis't Colum.	W.	37
Charles Hicks.....	" 30	May 10	.....	1631 Pierce street.	Virginia.	B.	34
James Town.....	May 6	" 24	.....	Detention Hospital.	"	"	20
Albert Epps.....	" 6	" 31	.....	" "	"	"	23
George Scott.....	" 6	" 31	.....	" "	"	"	21

George E. Wilson.....	" 9	June 7	.....	1323 Wilcox street.	Maryland.	W.	65
Benjamin Latham....	" 12	" 14	....	Schooner "C. E. Berger."	N. Carolina.	B.	24
George W. Knight....	June 16	" 9	.....	Sparrows Point.	Virginia.	"	21
Ellen Tyler.....	July 26	Aug. 16	.....	1004 Linden avenue.	"	"	27
Paul Goodrum	Aug. 28	.....	Sept. 1	Pungy "C. C. Fallin."	Dis't Colum.	"	16
Thomas Redding	Sept. 6	Nov. 3	.....	" " "	Virginia.	"	22
Thomas Reynolds	" 15	Oct. 13	.....	Johns Hopkins Hospital.	"	"	23
*Luther H. Pettijohn..	Dec. 29	.....	.....	Maryland General Hospital.	Delaware.	W.	22
Joseph Fari.....	.....	.....	April 16	Baltimore City Hospital. Sent to Quarantine by Department ambulance for burial.	New York.	"	28

*Still at Quarantine.

The following premises were quarantined, from which had been taken a smallpox case each to the Quarantine Station down the river, viz:

517 S. Greene street	9	persons.
1031 N. Vincent alley	7	"
427 Saratoga street	6	"
1323 Wilcox street	2	"
772 Dover street	4	"
800 China street	5	"
1004 Linden avenue	2	"
110 Chestnut street	7	"
Total	42	persons.

CLOTHING FUMIGATED AND RETURNED OWNERS.

Articles.	Number.	Articles.	Number.
Aprons	8	Night shirts	9
Blankets (pair)	4	Napkins	27
Basques	6	Neckties	23
Bolsters	3	Overalls	3
Bolster cases	3	Overcoats	7
Belts	8	Portieres (pairs)	1
Bonnets	3	Pantaloons (pairs)	56
Boas	1	Petticoats	28
Chemise	1	Pulse warmers	1
Carpets	3	Pillows	9
Coats	30	Pillow cases (pair)	9
Collars	45	Pin cushions	1
Clothes (suits)	4	Prayer books	1
Comforts	10	Rugs	2
Children's suits	22	Spreads	2
Caps	5	Skirts	23
Corsets	6	Shirts	41
Corset covers	8	Sheets (pairs)	16
Curtains (pair)	15	Stockings (pairs)	26
Cuffs (pairs)	5	Suspenders (pair)	3
Canopies	1	Sweaters	1
Dresses	25	Sashes	1
Drawers (pairs)	54	Shawls	1
Dolls	1	Table scarfs	3
Feather beds	2	Towels	12
Flannel (pieces)	7	Trunks	6
Gloves (pairs)	3	Table cloths	4
Hair (bundles)	1	Under shirts	21
Hair cloth (yards)	1	Uppers (pair)	1
Handkerchiefs	60	Underwear (pair)	4
Hats	15	Vests	218
Hoods	1	" blacks and linings	58
Lace (piece)	1	" trimmings	36
Lining (piece)	4	" collars	28
Mantel scarfs	18	" pockets	20
Mattresses	4	Waists	55
Matting	1	Wrappers	4
Muffs	1		

CLOTHING, ETC., DESTROYED.

Articles.	Number.
Aprons	1
Bolsters	8
Blankets	12
Clothes (suits)	9
Comforts	14
Carpets	2
Curtains	5
Cuffs (pairs)	7
Corsets (pairs)	1
Corset covers	1
Dresses	6
Drawers (pairs)	5
Feather beds	2
Flannel (pieces)	2
Hats	7
Hassocks	1
Handkerchiefs	14
Jackets	1
Lounges	1
Lace (yards)	10
Mattresses (private houses)	30
" (from steamships)	32,698
Mantel covers	1
Matting (pieces)	8
Neckties	1
Napkins	9
Night gowns	8
Overcoats	2
Petticoats	5
Pillow cases	6
" shams	3
Pillows	29
Pantaloons (pair)	1
Quilts	1
Stockings (pairs)	20
Spreads	2
Sheets	16
Shoes (pairs)	2
Shirts	13
Sacques	1
Towels	17
Table cloths	3
Trunks	1
Undershirts	10
Vests	1
Wrappers	11
Waists	4

ANATOMY BOARD.

Statement of bodies turned over to this Board by the Commissioner of Health, under Act of the General Assembly of Maryland, Chapter 163, 1882, to be used only to promote Medical Science in the State of Maryland and the medical schools of Baltimore City:

January 1st to December 31st, 1902, Inclusive.

	1901.	1902.
Adults	357	301
Between 1 and 5 years	15	22
Under 1 year	244	249
Still births	127	172
Total	743	744
Males	464	454
Females	279	283
Unknown sex	...	7
Total	743	744
Whites	172	229
Blacks	560	510
Unknown	11	5
Total	743	744

WHERE FROM.

	1901	1902
Bay View	107	97
Baltimore City Hospital	31	33
Baltimore City Jail	2	3
Canton Police Station	.....	1
Ellicott City	.....	2
Garrett Hospital	2	3
Homoepathic Hospital	7	8
Home of Mothers and Infants	.....	2
Hebrew Hospital	.....	1
Johns Hopkins Hospital	56	54
Franklin Square Hospital	.....	1
Maternite Hospital (115 W. Lombard street)	10	11
Morgue	89	12
Maryland General Hospital	37	41
Miscellaneous (private houses)	230	268
Mt. Wilson, Md.	.....	4
Nursery and Child's Hospital	.....	30
Northern Police Station	3	3
Northeastern Police station	.....	2
Northwestern Police station	6	7
Penitentiary	4	13
Provident Hospital	1	1
St. Elizabeth's Home	107	87
Samaritan Hospital	4	.....
St. Agnes Hospital	1	6
St. Joseph's Hospital	3	14
Southern Police Station	2	5
Southwestern Police Station	3	1
University Hospital	36	20
Union Protestant Infirmary	.....	1
Western Police Station	2	2
West End Maternite Hospital	.....	1
Totals	743	744

DISPOSITION.

	1901	1902
Baltimore Medical College	43	52
Baltimore University College	.....	14
College Physicians and Surgeons	258	316
Homoepathic College	3	3
Hebrew College	.....	1
Johns Hopkins Medical College	395	286
Maryland Medical	.....	19
1113 Madison avenue	.....	1
University of Maryland	40	50
Woman's College	2	2
Laboratory, 1 Destroyed, 1	2	...
Totals	743	744

TOTAL NUMBER HANDLED BY HEALTH DEPARTMENT.

	1901.	1902.
Buried in Potter's field	53	21
Surrendered to friends for burial	166	180
Transferred to Anatomy board	743	728
Totals	962	929

Respectfully submitted.

GEO. C. WEDDERBURN,
Index Clerk.

Report of the Burial Permit Clerk.

JAMES BOSLEY, M. D., *Commissioner of Health:*

DEAR SIR—I hereby respectfully submit the report of the work done by the Burial Permit Clerk for the year ending December 31, 1902.

The following table exhibits a summary of the various kinds of permits issued during the year:

1902. MONTHS.	Burial Permits. City.	Burial Permits. Transit.	Burial Permits. Still births.	Burial Permits. Shipping.	Burial Permits. Disinter.	Removal Permits.	Total.
January .	912	61	61	87	18	229	1,368
February	816	69	65	65	7	204	1,226
March ...	849	72	43	72	28	237	1,301
April	829	61	57	63	53	198	1,261
May.....	804	74	66	82	57	213	1,296
June	874	72	54	88	27	263	1,378
July	1,052	108	68	113	16	264	1.621
August ..	915	90	47	75	19	223	1,369
Septemb'r	812	80	55	76	41	197	1,261
October ..	742	72	71	68	55	185	1,193
Novemb'r	720	64	33	71	46	176	1,110
December	928	78	66	101	15	201	1,389
Total ..	10,253	901	686	961	382	2,590	15,773

During the year there were received from cemeteries and transportation companies 13,183 burial, disinter and shipping permits, which have been affixed to Certificates of Death, and applications for burial, and the same have been filed for record.

Respectfully submitted.

HARRY C. ANDREWS,
Burial Permit Clerk.

BALTIMORE, January 1, 1903.

To James Bosley, M. D.,
Commissioner of Health:

Dear Doctor—I beg to submit to you eleven maps to show the localities where deaths due to infectious and other diseases have occurred during the year 1902, and also the location of houses in which scarlet fever, diphtheria and typhoid fever have developed. First of all I call your attention to map showing deaths from tuberculosis.

TUBERCULOSIS.

This map is one of a series made for the purpose of determining as much as possible whether this cause of death is more marked in some parts of the city than in others, and also to ascertain by the original card records, from which the map record was made, whether or not certain houses were more infected than others.

It is unfortunate that we must depend on the death records for this information, for as yet cases of tuberculosis are so seldom reported (compared with their actual number), that it would be useless to depend upon them for full information.

Of the total number of deaths, 1,206, the colored people furnished 376, or a little over one-third. The colored population is just about one-sixth of the total population. Death from this disease amongst this race is therefore twice as great as amongst the white people. The cause of this is in part at least due to their poor homes and imperfect treatment. The prevalence of this disease amongst the colored people is a great menace to our white population, due to close association in their vocation as servants and nurses. In this connection please note that there were 23 drivers, 14 laundresses, 24 seamstresses and 105 servants, all of whom were colored.

Little at this time can be said about the contributing causes of death from this disease amongst the white people. Poor dwellings and crowded houses doubtless are important factors, but there is another which at this time deserves special mention, *i. e.*, their place of work. Please note that there were 29 merchants and 69 clerks victims. While we can not say positively that the disease was contracted at their places of business, yet certainly everyone must know that many offices and accounting rooms are not well calculated to promote the health of the workers. This condition of affairs has frequently resulted from a disproportionate growth of the business and accommodations for the employes. Doubtless the same can truthfully be said of the working places of artisans and mechanics. Evidence is certainly sufficient to warrant the employment of skilled inspectors by this Department to investigate conditions above referred to.

Finally I call attention to the number of children (79), who died from tuberculosis while under five years of age, and also the number (160), between the ages of five and twenty years; *i. e.*, the school years; coupled with this note that 19 school teachers died during this year.

PNEUMONIA.

There is shown this year a decrease in the number of deaths, but it is notable how high the death rate is amongst the negroes. More than a third of the deaths from pneumonia occur in this race. Please note the ages at deaths: 147 died under one year, 158 died between one and five years, making 305 under five years. I cannot help believing that the very many cases were broncho-pneumonia and have as a primary cause either measles or tuberculosis.

BRONCHO-PNEUMONIA.

Capillary bronchitis as classified with broncho-pneumonia. Nearly one-half of the deaths occurred in children less than one year of age. Between the ages of one year and five years there occurred 76 deaths. Many of these we believe had as a primary cause measles or whooping cough.

Taking the three diseases, *i. e.*, tuberculosis, pneumonia and broncho-pneumonia, we find that in 1902 they caused a total of 2,225 deaths, nearly one-fourth of the deaths from all causes. This certainly presents a great field for work in lessening our death rate. To do this work we must have enlarged facilities.

ALIMENTARY DISEASES.

This map has not been correctly named because I have included only deaths due to invasion of the stomach and intestines in children under 5 years of age. Please note, however, that almost all of the 741 deaths occurred under one year of age, *i. e.*, the milk feeding age. In the list of diseases are gastritis, gastro-enteritis, enteritis, enter-colitis, colitis, diarrhœa, summer complaint and cholera infantum; but I have not included deaths due to marasmus and inanition which caused 695 deaths. We feel confident that a large percentage of this number should have been classed with Alimentary diseases, and that it would be conservative to state that at least 1,000 children died of bowel troubles.

Naturally we look to the milk for an explanation of this mortality; but in doing so, one should be careful not to assert very positively, at this time, that the milk received into our city is the cause of the high mortality.

This we know, that there has been during the past five or six years a very great improvement in our milk supply, and that while formerly it was common to find milk with less than three per cent. butter-fat and thirteen per cent. total solids (which was spilled) that now it seldom is found so low, but

rather we find four, five and six per cent. butter-fat, with fourteen and fifteen per cent. total solids. Therefore there is probably less addition of water than formerly, but we have even a greater death rate than when the milk was poorer. We have found, however, that a great dilution of the milk occurs in many small shops, and a still further addition by the people by the addition of water, which probably is the source of so much bowel infection.

In this connection I beg to state, that in the region of the city included in the Second and Third wards where there are so many deaths from entero-colitis, that the children are breast-fed, and if any milk additional is given, it appears that condensed milk is used. How extensive this custom is I am not able to state, but Dr. G. W. Lehman, by our direction, is endeavoring to ascertain the truth.

Besides this source of pollution, we know that much damage is apt to be done before the milk leaves the farm, and we respectfully suggest that legislation be obtained so that all dairy farms sending milk to Baltimore should be placed under the control of the Health Department of this city.

Is it not curious that only 168 out of the 741 deaths occurred in colored babies? It might be due to the fact that so many die from lung diseases, and because they are breast-fed.

Dr. Storer, in our Laboratory, and Drs Knox and Bassett, at the Wilson Sanitarium, have been doing excellent work on this subject, and the discovery by the latter of one of the germs causing summer complaint will go a great way in solving the problem of lowering our death rate.

Our card catalogue shows this interesting fact that it often occurred that two, three or four children within the same square would die of the same disease, within the same week, and all at about the same age.

TYPHOID FEVER.

This preventable disease caused an increase in the number of deaths last year, and yet remained within bounds of the normal annual fluxation. On the map are shown the situation of 1,086 cases, but from the number of deaths, 220, we believe that there were 2,200 cases during the year. By the map you will see that the cases were well distributed over the entire city. We recognize, of course, that many cases were imported, but such a number of cases that is presented on the map and such an equable distribution could scarcely be brought about other than by a common source, and that source is our drinking water. Some recent investigations show that flies and other insects can convey the germ, but that won't account for the cases occurring out of fly-time.

We are pleased to note that the cases seem to be better reported than in former years. Compare the years 1898 and 1902 ; in the former year only about half the number of cases as in 1902 were reported, and yet there were 192 deaths.

DIPHTHERIA.

In this map we are able to show by the table attached that we have been able to obtain good results by persistent work against the disease. We fear, however, that the good work accomplished has made people again careless, and by the showing of the last three months of the year there will be an increase in 1903. It is gratifying to note that during the five years from 1898 to 1902 inclusive, there is a steady decrease in the number of cases from 2,079 in 1898 to 972 cases in 1902. But still more gratifying is the decrease in the death rate, which we believe to be due to the early use of antitoxine. In 1898 there were 412 deaths, or a percentage of 19.82, and in 1902 there were 130 deaths, or a percentage of 13.37, a decrease in the death rate of 6.45 per cent.

SCARLET FEVER.

This disease has been mild for many years, certainly for the past twenty. We have placed a table on the map to show the number of cases by month and year for the past five years. While the number of cases is less than in 1898, yet the number of cases occurring during the months from July to December, inclusive, is greater than in any other year, coupled with the fact that there seems to be a concentration in the Third and Fifth wards, makes the outlook for 1903 somewhat disquieting.

The maps showing the distribution of deaths due to cancer, heart disease, bright's disease and tetanus, have been made to preserve as records and future work.

It was noticed while making the card records of cancer, that it frequently caused death in the same house, but different families, nearly the same date. It also occurred within the same block of houses.

Yours respectfully,

C. Hampton Jones, M. D.
Assistant Commissioner of Health.

Baltimore, Mayor's

— THE —

MAYOR'S MESSAGE

— AND —

Reports of the City Officers and Departments

— MADE TO THE —

CITY COUNCIL OF BALTIMORE

FOR THE YEAR 1902.

BALTIMORE:
JOHN D. LUCAS PRINTING CO., PUBLIC PRINTER,
No. 210 WATER STREET.

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Board of Fire Commissioners.
Examining Board of Fire Department.
City Collector.
Board of School Commissioners.
Superintendent of Lamps and Lighting.
Visitors to City Jail.
Municipal Statistician.
Supervisors of City Charities.
Water Department.
Board of Park Commissioners.
Inspector of Buildings.
Harbor Board.
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Public Bath Commission.
Collector of Water Rents and Licenses.
Topographical Survey Commission.
Superintendent Public Buildings.
City Librarian.
Commissioners for Opening Streets.
City Engineer.
Health Department.

267386

ANNUAL MESSAGE

—— OF ——

Hon. Thomas G. Hayes, Mayor,

—— TO THE ——

CITY COUNCIL OF BALTIMORE,

February 23rd, 1903.

The John D. Lucas Printing Company,
Public Printer,
No. 210 Water Street.

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MAYOR'S MESSAGE.

BALTIMORE, February 1, 1903.

To the Honorable the Members of the City Council:

GENTLEMEN:

In conformity with the requirements of Section 22 of the City Charter, I submit the annual report required by that Section:

The voters of the city on the Tuesday after the first Monday of May next will elect, with the exception of four members of the Second Branch, municipal officials to administer the municipal affairs for the next four years. It may not be out of place to review some of the results attained by the present administration during the three and one-half years just passed.

The first and most important fact is that the city government has been honestly and economically conducted. Scandals which have in this time disgraced many of our city governments elsewhere, have been unknown in our city. The public money has been honestly and economically expended, and full value has in all cases been received. No jobs or rake-offs on contracts have been tolerated. The lowest responsible bidders, without the necessity of seeking outside aid, have been the ones who have done the work or furnished the supplies for the city. Specifications which require the broadest competition have always been required, and favoritism in awarding contracts

is unknown in the government of Baltimore. I believe it to be a fact that during the present administration not a single corrupt lobby scheme has been even attempted. It has been my persistent desire and effort to conduct the municipal government on business principles. There is no reason why this should not be done in all municipal governments. The principles which divide the parties do not enter into the administration of municipal government. No municipal government should be allowed to be made a political machine.

Too much praise cannot be given to the City Charter; its provisions are wise, and intended to protect the public interests and prevent reckless and extravagant expenditures of the public money. The exercise of the functions and powers of the Board of Estimates has been the principal agency in the improvement of our city government, and the people of this city should see that no impairment of their functions and powers is tolerated.

In reviewing what has been accomplished by the present administration, I do not hesitate to say that these results have been attained by a hearty co-operation by the various municipal officers with the executive head of the city government. In reviewing these results it may be well to first mention the saving on interest paid heretofore for temporary loans. The result here accomplished demonstrates one of the principal evils of the former administrations.

I.

Interest Saved and Received.

Prior to the present administration large sums of money were annually paid by the city for interest on temporary loans made to meet deficiencies in appropriations. The present administration has reversed this, and instead of paying interest

the city has been receiving interest on the daily balances of the city's money in the banks. For the five years preceding the present administration the city paid as interest on temporary loans the sum of $553,314.77; since the present administration has been in charge of the city government the city has received as interest from the banks the sum of $132,262.97. This saving of $553,314.77 plus $132,262.97, making $685,577.74, gives to the city money enough to pave fourteen miles of streets with improved pavements.

The following table gives in detail the above saving:

Interest Paid Out.

1894.	On Temporary Loans	$172,426 43
1895.	" "	165,997 63
1896.	" "	179,090 97
1897.	" "	23,501 41
1898.	" "	12,298 33
	Total	$553,314 77

Interest Received.

1898.	Interest Paid by Banks	$ 1,605 64
1899.	" " "	27,095 26
1900.	" " "	29,021 03
1901.	" " "	30,473 86
1902.	" " "	44,067 18
	Total	$132,262 97

II.

Sinking Fund and Debt.

This fund, provided to meet the funded obligations of the city at maturity, has not been plundered and robbed, as in former administrations, to keep down the tax rate, but has been kept sacred. It has been increased by $8,276,395.61,

making the total Sinking Fund at present $17,592,373.38, to which, if we add the productive assets and deduct the result from the total funded debt of the city, there is left a net debt of only $8,755,290.41, which would be more than wiped out by the non-productive assets of the city, such as city hall, courthouse, engine and market houses, and the 120 public schoolhouses, female high schools and city college.

III.

Savings in Fire Department.

While the efficiency of the service of the Fire Department has been greatly increased, and the number of engines, horses and men also increased, which necessitated increased expenditures, yet the net expenditure for maintaining the service has been decreased, as appears from the following table:

1897.	Expenses	$113,863 38
1898.	"	135,830 02
1899.	"	124,968 70
1900.	"	90,403 76
1901.	"	110,681 00
1902.	"	103,346 93

This table shows that the saving in the expense account of the Fire Department for the years 1900, 1901 and 1902, as compared with the three previous years was $70,230.41. This saving has resulted from careful attention to the affairs of the department; for instance, the buying of hose of the same or equal quality for 65 cents a foot, instead of paying $1.00 a foot for the same hose, as had been previously done; the letting of all contracts for supplies or repairs less than $500.00 to the lowest bidder, after fair competition. In other words, this reduction in the expense account results from the application of business principles to the administration of a municipal department. While this saving in the three years of

$70,230.41 has been accomplished, it must not be forgotten that more engine houses have been built and rebuilt than in any other administration. The following is a list of such houses built or rebuilt and the amounts expended or to be expended:

New Engine Houses.

No. 11 Truck House and Ground	$24,295 32
" 11 " " for heating	1,200 00
" 22 Engine House and Lot	20,486 00
" 23 " " "	46,000 00
" 24 " " "	30,000 00
" 25 " " "	20,000 00
" 7 Truck " "	19,020 59
Rebuilding No. 3 Truck House	6,886 14
" " 14 " "	10,665 08
" " 18 " "	7,342 35
" " 5 Chemical	1,667 03
" " 5 Engine	6,302 06
" " 2 "	9,217 77
" " 10 "	7,257 70
Total	$210,340 04

IV.

Water Rents Reduced.

There has been a great reduction in the amounts paid for water rents by the occupants of dwelling houses, as shown by the following table:

	1899.		1902.
In houses not over 17 ft. front	$9 00,	reduced	$8 00
" " 16 "	8 00,	"	6 00
" " 15 "	7 00,	"	5 00
" " 14 "	6 00,	"	4 00
" " 13 "	5 00,	"	3 00
" " 12 "	3 00,	"	2 00

In addition to this reduction, there is now no charge for hose attachments in private houses, for which the previous charge was $3.00 per annum.

This reduction in water rents leaves in the pockets of the householders the large sum of $170,000 per year, which, capitalized at 3 per cent., is equivalent to over five and one-half millions of dollars.

In addition, the receipts from water rents support the Water Department, pay a surplus into the treasury of the city, and pay the interest and sinking fund on a loan of $1,000,000.00 to build a new reservoir and improve the water service.

It may with propriety be asked how can this large reduction in water rents be made, the department maintained, a surplus annually paid into the city treasury, and a large loan provided for? The answer is that the men who run the sub-department are competent experts who are honest and in sympathy with the policy of an economic business administration of the city government. This is the first time such remarkable results have been obtained from this sub-department, although the income has not materially increased. The credit is due to putting into practice a business administration of municipal government.

V.

Saving in Electric Lights in Druid Hill Park.

The present administration, by utilizing the surplus power which has always existed at one of the water pumping stations at Druid Hill Park, has lighted with electric lights the entire area of Druid Hill Park, thus saving to the city annually the sum of $7,358.80, which capitalized at 3 per cent. is $245,293.

VI.

Public Schools.

The business and economic policy of this administration has enabled it to be liberal in its expenditures and appropriations, to meet the growing demand for additional public school buildings and grounds.

The following buildings have been erected or are in course of construction, with their cost, including lot:

	Cost.
Addition—Twenty-fifth street, near St. Paul street	$20,000 00
Building—Chestnut and Fourth avenues	46,769 42
" Lake avenue and Orleans street	67,401 00
" Johnson and Heath streets	68,214 00
" Walbrook avenue and Smallwood street	69,872 09
" Twenty-second and Cromwell streets	76,029 00
TO BE ERECTED IN 1903.	
Building—Hollins, near Schroeder street	$45,000 00
" Mount and Saratoga streets	50,000 00
Total for School Buildings	$443,285 51

The first step has been taken to give East Baltimore a modern Female High School, equal in all appointments to any in the city of Baltimore.

The promise was given by the present administration to remove the public schools of Baltimore city from the domain of politics. It has been done. The standard of public education has been elevated, and our public schools are on the road to be the first in the country.

VII.

Savings by City Engineer.

During the present administration there have been actually constructed 3.472 miles of improved pavements, and there has been appropriated for improved pavements, which will be laid as soon as the weather permits, a sum sufficient to pave 1.398 miles more, or in all 4.870 miles of improved pavements, which constitute about 10 per centum of the entire amount of improved pavements.

The cost of all improved pavements during the present administration has been less than the price paid in previous administrations.

The average cost of Belgian block laid during the present administration has been $1.92 per square yard. Some work on this pavement, done by day labor during the years 1889 to 1895, inclusive, cost from $3.30 to $14.97 per square yard.

The price of sheet asphalt pavement during the present administration has varied from $2.08 to $2.25 per square yard; from 1885 to 1893 the lowest cost was $2.00 per square yard and the highest $2.75, the average cost in previous administrations being about $2.73 per square yard. Block asphalt laid in the last three years on a concrete foundation cost $2.00 to $2.50 per square yard, while the average price from 1881 to 1894 laid on a sand foundation was $2.50 per square yard. A concrete foundation adds not less than fifty cents per yard to the cost of laying block asphaltum.

Vitrified brick pavement has cost during the present administration $1.45 per square yard on sand foundation and $1.99 on concrete foundation. During the city administrations from 1881 to 1894 the price varied from $1.80 to $3.67 per square

yard on sand foundation, no concrete foundation having been used prior to the present administration.

There have been built during the present administration two and two-third miles of sewers, which is about 6 per cent. of the entire amount of sewers in the city. These sewers were provided with fifty-two inlets, and in addition fifty-one new inlets were constructed on existing sewers.

In every case of sewer construction during the present administration there has been a saving of from 10 to 25 per cent. in the cost of construction.

There is no greater advocate for placing improved pavements upon every street in this city than myself. My every public utterance since I have been Mayor attests this fact, but I am anxious to prevent the wasteful expenditure of the taxpayers' money, and I do not think that the large cost of improved pavements should be incurred until a sewerage system is constructed. If the improved pavement is laid before the sewer system is built, the money for the improved pavement is lost, as a destruction of the improved pavement must result from the sewer construction and house connection. The present administration approves of at once putting improved pavements down on every street which is not to be occupied by the sewer. The taxpayers should realize what it means to them to pave streets with improved pavements and then destroy them by a sewerage system.

The present administration thinks also that a wise and well digested plan for paving the streets should be adopted by a body of experts before the work of construction is begun. It is not wise to patch up here and there existing pavements with improved pavements. The whole city requires and should have laid improved pavements on every highway.

It may be well to note that the 4.870 miles of improved pavement laid during the present administration has been paid

for by either direct taxation or assessment on abutting owners. In no previous administration has any such extent of improved pavement been laid and paid for in this manner. Loans of large amounts have been the source of the payment of improved pavements in the past, and not direct taxation and assessment on abutting owners.

VIII.

Reduction in Tax Rate.

Baltimore, compared with other large cities, is poor. The bulk of direct taxes is paid by the house owners, a large majority of this class being people of moderate means. A high tax rate to many of this class means almost confiscation. Although expenditures for departments and new improvements have been large, indeed for the latter larger than that of any previous city administration, the taxes have been kept much lower than the three previous years, as appears from the following table:

Tax Rate.

1896	$2 00
1897	2 00
1898	2 25
1899	1 98
1900	1 67
1901	1 81½
1902	1 95
1903	1 86¾

It must be remembered, of this annual tax rate 46 cents on the $100 is for that incubus, a bonded indebtedness, one of the legacies from the old administrations, and if we were to deduct this 46 cents from the tax rate of the present administration, the tax rate for the last four years would have been

$1.21, $1.35½, $149 and $1.40¾. Such a rate would have given the taxpayers of Baltimore, so far as I am advised, considering the taxable basis and population, the smallest tax rate of any city in the Union. If there had been no interest to pay on the funded debts already incurred, the average rate would have been $1.36½. A tax then of $1.70 would have furnished a million dollars a year for street paving—about twenty miles a year.

IX.

Sale of the Western Maryland Railroad.

The purchase of the Western Maryland Railroad by the Wabash people promises to be an important factor in the development of Baltimore. It gives the city another trunk line —puts Baltimore in more intimate relation with the vast wealth of the Middle West and Southwest, opens up new fields and avenues for the trade of our merchants, and brings to our door the inexhaustible coal fields of West Virginia—giving Baltimore, with an unlimited supply of cheaper coal, an opportunity unequalled by any city on the Atlantic Seaboard for developing and multiplying her manufacturing industries. It means employment for labor, tenants for our houses, customers for our trades people, and increased wealth and prosperity for the city as a whole. The manufacturing industry of Baltimore, by cheaper fuel and greater transportation facilities, resulting from the sale of the Western Maryland Railroad, will be greatly stimulated. Manufacturing industries are the true source of municipal prosperity. It is needless for me to repeat what I have so often publicly declared, that the municipal government should do all in its power to encourage

manufactories. Plant exemption, use of public property at small charge, and everything else to encourage and promote this industry, the city should unhesitatingly do. This has ever been my policy, and will be faithfully followed in the future.

The sale was made in the open market directly with the people's representatives, without the intervention of any middleman, and the purchase money, without any deduction whatever for commissions or anything else, was paid into the treasury of the city. The sale was made after a free and full discussion by the press and people, and the entire transaction met the unqualified and practically unanimous approval of everyone. Baltimoreans can point with pride that, in an age of public corruption, a financial matter of this magnitude could be carried through without a breath of scandal or suspicion.

I was able to quickly discern what were the true interests of Baltimore in this matter. I announced my opinion as to what the interests of Baltimore required, and firmly stood by it until the public voice had quelled all opposition.

X.

Savings in City Jail.

The improvement in the management and reduction in maintaining cost of the City Jail is a monument to a business administration of the city government. A pleasing and remarkable fact is shown in the report of the Visitors to the Jail, that in the years of this administration, while the number of prisoners has increased the cost of operation has

steadily and largely decreased. The following table clearly shows this fact:

Year.	No. of Prisoners.	Net Cost.	Cost per Prisoner.
1898	649	$20,708 18	$47 14
1899	647	24,113 94	44 85
1900	616	18,056 10	36 28
1901	642	13,716 10	32 90
1902	692	10,455 35	28 17

The credit for this magnificent showing is due chiefly to the capacity and splendid executive ability of Warden James T. Doyle, to whom the taxpayers owe a debt of gratitude for reducing to so large an extent the current expenses of the City Jail.

XI.

Health Department.

No city in this country has a health department superior to that of Baltimore, and few cities are equal to it in efficiency. A single instance will attest its efficiency—While smallpox has been almost an epidemic in adjacent cities and some of the counties of this State, there have been but 34 cases in Baltimore. The public health has been carefully guarded, nuisances abated, and splendid service rendered by this sub-department.

XII.

Lighting Streets and Bridges.

Too much praise cannot be given to Mr. McCuen, Superintendent of Lamps and Lighting. The city was never better lighted. The cluster lights on the bridges and the chandelier lights on St. Paul Street Bridge attest his efficiency and faithful attention to the duties of his office.

XIII.

Street Cleaning.

The force on the streets has been uniformed, and the service rendered by these employees has been by many of our best citizens commended.

XIV.

Municipal Subways.

These subways in the congested district have been completed, and the overhead wire companies are now engaged in putting their cables in these subways. I trust shortly to have all overhead wires in these subways. The money has been provided to extend this system and work on this extension will, as soon as weather permits, commence.

XV.

Appeal Tax Court.

This Sub-Department has performed faithful service. By its efforts the taxable basis has been largely increased and the basis reduced to a solid condition by eliminating worthless property.

XVI.

Building Inspector.

Mr. Preston has rendered the very best service. His untiri efforts in the discharge of his arduous duties have been attended with the best results.

XVII.

What Next Administration Should Accomplish.

The present administration has been one of economy and preparation, a straightening out of the books, a gathering together of the vital forces and energies of our city. The succeeding administration should be one of expansion and development, the beginning of the career of *Greater Baltimore* based upon a firm and substantial foundation.

The credit of Baltimore is now equal, if not superior, to that of any city in the Union. A wise, conservative and firm policy has put the city in a position to at once begin, in a systematic and business-like way, all the improvements so much needed, to make it in fact, as well as in name, the "Commercial Metropolis of the South."

The sale of the Western Maryland Railroad realized, over and above the amount set apart and dedicated to meet the obligations of that railroad as they mature, and for which the city is responsible, the splendid sum, with accumulated interest, of about $5,000,000. This sum has been invested and secured by city stock, so that its safety is absolute.

Practical and skilled engineers have estimated that a complete sewerage system for Baltimore city can be built with this sum of money, and its accumulations of interest during the construction of the sewers, without adding a penny to the tax rate. This work would have been begun on January 1, 1903, if the present City Council had adopted the recommendations of the present Mayor.

Following the construction of the sewers in each street, and as fast as it is completed, will come the improved pavement, and in the meantime such streets as are not to be used in the

construction of sewers, and which form part of a system for connecting all parts of the city, will be laid with improved pavements, so that practically, as soon as the sewers are completed, Baltimore will also be supplied with a system of streets with improved and modern pavements equal to any city in the Union.

The proposed parking of Gwynn's Falls and Stony Run, for which skilled engineers have been preparing plans for more than a year, embracing a series of boulevards connecting all the parks of the city, has received serious consideration—(some land has been bought)—in fact begun—and it is hoped can be accomplished in the near future. It will add greatly to the beauty of our city, increase the comfort and pleasure of the people in all parts of the city, and greatly enlarge the taxable basis.

The recommendations of Engineer Gray for the improvement of our water supply have been endorsed by the present administration. Steps have already been taken for the purchase of sites for a storage reservoir and a stand-pipe, and in the near future it is hoped our water supply in quantity and purity will be unequalled by any modern city.

The controlling purpose of the next administration should be progress. Baltimore should be made the most attractive city in this or any country. Nature has supplied much to Baltimore, and man should make use of these natural advantages. No modern municipal improvement should be wanting in Baltimore. A wise and a proper plan and policy should at all times be followed in providing what improvements are needed. The people will never object to furnishing all the money needed for these improvements, provided the money is honestly and wisely spent and full value received.

Washington, being the capital of the nation, is recognized as the lodestone, the great point of attraction, all over the

United States, and Baltimore being only forty-five minutes distant should be made so beautiful and attractive and famous, because of this beauty and attractiveness, that everybody visiting Washington would feel that they had not done themselves justice nor completed their trip without visiting Baltimore.

The separate reports of the various departments, subdepartments and municipal officials not embraced in a department will give more in detail what has been accomplished, to which the members of the City Council are respectfully referred.

Respectfully submitted,

THOMAS G. HAYES, *Mayor.*

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